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NOTE FROM PUBLISHER

It gives me great pride and pleasure in bringing to you **Sura's Mathematics Guide** for **7th Standard [Term-I+II+III]**. It is prepared as per the updated Textbook.

This guide encompasses all the requirements of the students to comprehend the text and the evaluation of the textbook.

♦ Additional questions have been provided exhaustively for clear understanding of the units under study.

♦ Chapter-wise Unit Tests with Answers.

In order to learn effectively, I advise students to learn the subject section-wise and practice the exercises given. It will be a teaching companion to teachers and a learning companion to students.

Though these salient features are available in this Guide, I cannot negate the indispensable role of the teachers in assisting the student to understand the subject thoroughly.

I sincerely believe this guide satisfies the needs of the students and bolsters the teaching methodologies of the teachers.

I pray the almighty to bless the students for consummate success in their examinations.

Subash Raj, B.E., M.S.
- Publisher
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NUMBER SYSTEM

INTEGERS :

✦ Collection of the natural numbers, zero and the negative numbers gives integers. The collection of integers are denoted by Z.

✦ Negative integers are represented on the number line to the left of zero and the positive integers to the right of zero.

✦ Every integers on the number line is placed in an increasing order from left to right.

ADDITION OF INTEGERS :

✦ The sum of two positive integers is positive.

E.g: $(+5) + (+4) = +9$

✦ The sum of two negative integers is negative.

E.g: $(-2) + (-5) = -7$

✦ The sum of a positive and a negative integer is the difference of the two numbers in value and has the sign of the greater integer.

E.g: $(-3) + (+5) = +2$

$(+3) + (-5) = -2$

PROPERTIES OF ADDITION :

✦ **Closure Property:** The sum of two integers is always an integer i.e. for any two integers a and b; $a + b$ is also an integer. This property is known as 'closure property' of integers on addition.

✦ **Commutative Property:** For any two integers a and b; $a + b = b + a$. This property is known as 'commutative property' of integers.

Associative Property:

✦ For any three integers a, b, and c; $a + (b + c) = (a + b) + c$. This property is known as Associative property of integers under addition.

Additive Identity:

✦ When '0' is added to an integer, we get the same integer.

i.e. For any integer a, $a + 0 = a = 0 + a$

Due to this property zero is called the additive identity.

Additive Inverse

✦ When opposites are added together always give the value zero.

E.g. $(-5) + (+5) = 0$

In this case either of the pair of opposites is known as the additive inverse of the other.

i.e. For any integer a, $–a$ is the additive inverse.

$a + (–a) = 0 = (–a) + a$

Subtraction of Integers:

✦ To subtract an integer from another, we add the additive inverse of the integer which is to be subtracted.

E.g. (i) $\quad 7 – (–5) \quad = \quad 7 + (+5) \quad\quad = 12$

(ii) $\quad (–7) – (+5) \quad = \quad (–7) + (–5) \quad = –12$

✦ Every subtraction statement has a corresponding addition statement.

E.g. $8 – 5 = 3$; Subtraction statement. $3 + 5 = 8$; Addition statement.

Properties of Subtraction :

✦ The difference of two integers is always an integer.

i.e. For any two integers a, b; $a – b$ is also an integer. Closure property is true for integers on subtraction.

✦ For any two integers a, b; $a – b \neq b – a$. ∴ Commutative property does not hold for subtraction of integers.

E.g. $\quad\quad\quad\quad 3 – (–1) \quad = \quad 3 + 1 = 4$

$\quad\quad\quad\quad\quad (–1) – (3) \quad = \quad –1 + (–3) = –4$

$\quad\quad\quad\quad\quad 3 – (–1) \quad \neq \quad (–1) – 3$

🙌 TRY THESE

(Text book Page No. 1)

1. Write the following integers in ascending order: –5, 0, 2, 4, –6, 10, –10

Sol : Plotting the points on the number line, we get

The numbers are placed in an increasing order from left to right.

∴ Ascending order: $–10 < –6 < –5 < 0 < 2 < 4 < 10$

2. If the integers –15, 12, –17, 5, –1, –5, 6 are marked on the number line then the integer on the extreme left is _____.

Sol : The least number will be on the extreme left.

∴ –17 will be on the extreme left.

3. Complete the following pattern:

___, – 40, ___, ___, –10, 0, ___, 20, 30, ___, 50.

Sol : The difference between the consecutive number is 10.

50, 40, 30, 20, <u>10</u>, 0, –10, <u>–20</u>, <u>–30</u>, –40, <u>–50</u>, <u>–60</u>

4. **Compare the given numbers and write "<", ">" or "=" in the boxes.**

(a) –65 ☐ 65   (b) 0 ☐ 1000   (c) –2018 ☐ –2018

Sol : (a) –65 $\boxed{<}$ 65, A positive number is greater than a negative number.

(b) 0 $\boxed{<}$ 1000, 0 is less than all positive integers.

(c) –2018 $\boxed{=}$ –2018

5. **Write the given integers in descending order, –27, 19, 0, 12, –4, –22, 47, 3, –9, –35.**

Sol : Separating positive and the negative integers, we get –27, –4, –22, –9, –35

Arranging the numbers in descending order –4 > –9 > –22 > –27 > –35

The positive numbers are 19, 12, 47, 3

Arranging in descending order, we get 47 > 19 > 12 > 3

0 stands in the middle.

∴ Descending order: 47 > 19 > 12 > 3 > 0 > –4 > –9 > –22 > –27 > –35

🙌 TRY THIS

1. **Find the value of the following using the number line activity.**

(i) **(–4) + (+3)**   (ii) **(–4) + (–3)**   (iii) **(+4) + (–3)**

Sol : (i) **(–4) + (+3)**

To find the sum of (–4) and (+3), we start at zero facing positive direction continuing in the same direction and move 4 units backward to represent (–4).

Since the operation is addition we maintain the same direction and move three units forward to represent (+3)

We land at –1

So (–4) + (+3) = –1
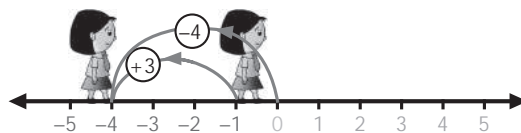
(ii) **(–4) + (–3)**

From zero move 4 steps backward to represent (–4)

From the same direction again move 3 units backward to represent (–3)

We land at –7

So (–4) + (–3) = –7
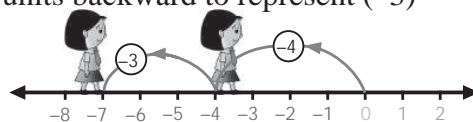
(iii) **(+4) + (–3)**

We start at zero facing positive direction and move 4 steps forward to represent (+4)

Since the operation is addition we maintain the same direction and move three units backward to represent (–3).

We land at +1.

So (+4) + (–3) = +1

PROPERTIES OF ADDITION

(Text book Page No. 6)

1. **Complete the given table and check whether the sum of two integers is an integer or not?**

(i) $7 + (–5)$ = **(+2)** (ii) $(–6) + (–13)$ = **(–19)**

(iii) $25 + 9$ = **34** (iv) $(–12) + 4$ = **–8**
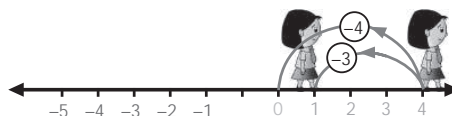
(v) $41 + 32$ = **73** (vi) $(–19) + (–15)$ = **(–34)**

(vii) $52 + (–15)$ = **(+37)** (viii) $(–7) + 0$ = **(–7)**

(ix) $0 + 12$ = **12** (x) $14 + 0$ = **14**

(xi) $(–6) + (–6)$ = **(–12)** (xii) $(–27) + 0$ = **–27**

Sol : ∴ The sum of two integers is an integer.

TRY THESE

(Text book Page No. 7)

1. **Fill in the blanks:**

(i) $20 + (–11) = $ **– (11)** $+ 20$ [∵ Addition is commutative]

(ii) $(–5) + (–8) = (–8) + $ **(–5)** [∵ Addition is commutative]

(iii) $(–3) + 12 = $ **12** $+ (–3)$ [∵ Addition is commutative]

2. **Say True or False.**

(i) $(–11) + (–8) = (–8) + (–11)$ - **True,** because addition is commutative for integers.

(ii) $–7 + 2 = 2 + (–7)$ - **True,** by commutative property on integers.

(iii) $(–33) + 8 = 8 + (–33)$ - **True,** by commutative property on integers.

3. **Verify the following.**

(i) $[(–2) + (–9)] + 6 = (–2) + [(–9) + 6]$

(ii) $[7 + (–8)] + (–5) = 7 + [(–8) + (–5)]$

(iii) $[(–11) + 5] + (–14) = (–11) + [5 + (–14)]$

(iv) $(–5) + [(–32) + (–2)] = [(–5) + (–32)] + (–2)$

Sol : (i) $[(–2) + (–9)] + 6 = (–2) + [(–9) + 6]$

$[(–2) + (–9)] + 6 = (–11) + 6 = –5$

Also $(–2) + [(–9) + 6] = (–2) + (–3) = –5$

Both the cases the sum is –5.

∴ $[(–2) + (–9)] + 6 = (–2) + [(–9) + 6]$

(ii) $[7 + (–8)] + (–5) = 7 + [(–8) + (–5)]$

Here $[7 + (–8)] + (–5) = (–1) + (–5) = –6$

Also $7 + [(–8) + (–5)] = 7 + (–13) = 7 – 13 = –6$

In both the cases the sum is –6.

∴ $[7 + (–8)] + (–5) = 7 + [(–8) + (–5)]$

(iii) $[(–11) + 5] + (–14) = (–11) + [5 + (–14)]$

Here $[(–11) + 5] + (–14) = (–6) + (–14) = (–20)$

$(–11) + [5 + (–14)] = (–11) + (–9) = (–20)$

Term I

In both the cases the sum is –20.

∴ [(–11) + 5] + (–14) = (–11) + [5 + (–14)]

(iv) (–5) + [(–32) + (–2)] = [(–5) + (–32)] + (–2)

(–5) + [(–32) + (–2)] = (–5) + (–34) = –39

Also [(–5) + (–32)] + (–2) = (–37) + (–2) = –39

In both the cases the sum is –39.

∴ (–5) + [(–32) + (–2)] = [(–5) + (–32)] + (–2)

4. Find the missing integers:

(i) 0 + (–95) = **–95**

(ii) –611 + **0** = –611

(iii) ___ + 0 = ___ **Any integer; the same integer**

(iv) 0 + (–140) = **–140**

5. Complete the following:

(i) –603 + 603 = **0**   (ii) 9847 + (–9847) = **0**

(iii) 1652 + (–1652) = **0**   (iv) –777 + **777** = 0

(v) **–5281** + 5281 = 0

EXERCISE 1.1

1. Fill in the blanks:

(i) (–30) + ___ = 60 **[Ans: 90]**

(ii) (–5) + ___ = –100 **[Ans: –95]**

(iii) (–52) + (–52) = ___ **[Ans: –104]**

(iv) ___ + (–22) = 0 **[Ans: 22]**

(v) ___ + (–70) = 70 **[Ans: 140]**

(vi) 20 + 80 + ___ = 0 **[Ans: –100]**

(vii) 75 + (–25) = ___ **[Ans: 50]**

(viii) 171 + ___ = 0 **[Ans: –171]**

(ix) [(–3) + (–12)] + (–77) = ___ + [(–12) + (–77)] **[Ans: –3]**

(x) (–42) + [___ + (–23)] = [___ + 15] + ___ **[Ans: +15; –42; –23]**

2. Say True or False.

(i) The additive inverse of (–32) is –32 **[Ans: False]**

(ii) (–90) + (–30) = 60 **[Ans: False]**

(iii) (–125) + 25 = –100 **[Ans: True]**

3. Add the following.

(i)   8 and –12 using number line.

Sol : Starting at zero on the number line facing positive direction and move 8 steps forward reaching 8.

Then we move 12 steps backward to represent –12 and reach at –4.

∴ 8 + (–12) = –4
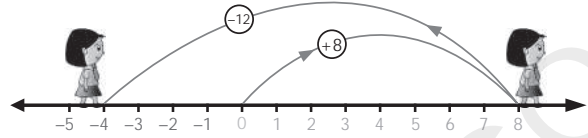
(ii) (–3) and (–5) using number line.

Sol : Starting at zero on the number line facing positive direction and move 3 steps backward reaching –3.

Then we move 5 steps backward to represent –5 and reach –8.

∴ (–3) + (–5) = –8
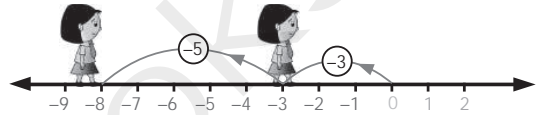
(iii) (–100) + (–10)   **Sol :** (–100) + (–10) = –100 – 10 = –110

(iv) 20 + (–72)   **Sol :** 20 + (–72)   = 20 – 72   = –52

(v)   82 + (–75)   **Sol :** 82 + (–75)   = 82 – 75   = 7

(vi) –48 + (–15)   **Sol :** –48 + (–15)   = –48 – 15   = –63

(vii) –225 + (–63)   **Sol :** –225 + (–63) = –225 – 63 = –288

4.   Thenmalar appeared for competitive exam which has negative scoring of 1 mark for each incorrect answers. In paper I she answered 25 question incorrectly and in paper II 13 questions incorrectly. Find the total reduction of marks.

Sol : For each incorrect question the score   = –1
In paper I, score for 25 incorrect questions   = 25 × (–1) = –25
In paper II, for 13 incorrect question the score   = 13 × (–1) = –13
The total marks get reduced   = (–25) + (–13) = –38
–38 marks will be reduced.

5.   In a quiz competition, Team A scored +30, –20, 0 and team B scored –20, 0,+30 in three successive rounds. Which team will win? Can we say that we can add integers in any order?

Sol :   Total score of team A = [(+30) + (–20)] + 0 = (+10) + 0 = 10
Total score of team B   = [(–20) + 0] + (+30)
                         = –20 + 30 = +10

Score of team A = Score of team B. Yes, we say that we can add integers in any order.

6. **Are (11 + 7) + 10 and 11 + (7 + 10) equal? Mention the property.**

Sol : First we take (11 + 7) + 10 = 18 + 10 = 28

   Now 11 + (7 + 10) = 11 + 17 = 28

In both the cases the sum is 28. ∴ (11 + 7) + 10 = 11 + (7 + 10)

This property is known as associative property of integers under addition.

7. **Find 5 pairs of integers that added to 2.**

Sol : 0 + 2 = 2

   1 + 1 = 2

   –1 + 3 = 2

   –2 + 4 = 2

   –3 + 5 = 2 (and many more.)

Objective Type Questions

8. **The temperature at 12 noon at a certain place was 18° above zero. If it decreases at the rate of 3° per hour at what time if would be 12° below zero?**

(i) 12 mid night   (ii) 12 noon

(iii) 10 am   (iv) 10 pm   **[Ans : (iv) 10 pm]**

Sol : Temperature at 12 noon = 18° above zero = +18°

Rate of decrease per hour = –3°

Temperature 12° below zero = –12°   –12 is 30 units to the left of +18°

Time at which it reach –12° = $\dfrac{30}{3}$ = 10 h   10 hrs after 12 noon = 10 pm

9. **Identify the problem with negative numbers as its answer.**

(i) –9 + (–5) + 6   (ii) 8 + (–12) – 6

(iii) –4 + 2 + 10   (iv) 10 + (–4) + 8

Sol : (i) –9 + (–5) + 6   = –14 + 6 = –8

(ii) 8 + (–12) – 6   = –4 – 6 = +2

(iii) –4 + 2 + 10   = –2 + 10 = 8

(iv) 10 + (–4) + 8   = 6 + 8 = 14   **[Ans : (i) –9 + (–5) + 6]**

10. **(–10) + (+7) = _____**

(i) +3   (ii) –3   (iii) –17   (iv) +17   **[Ans : (ii) –3]**

11. **(–8) + 10 + (–2) = _____**

(i) 2   (ii) 8   (iii) 0   (iv) 20   **[Ans : (iii) 0]**

12. **20 + (–9) + 9 = ____**

(i) 20   (ii) 29   (iii) 11   (iv) 38   **[Ans : (i) 20]**

ADDITIONAL QUESTIONS

1. **When Malar woke up her temperature was 102ºF. Two hours later it was 3º lower, what was her temperature then?**

Sol : Initially Malar's temperature = 102ºF

After two hours it lowered 3º $\Rightarrow$ –3ºF

$\therefore$ Here present temperature = 102º + (–3º) = 99ºF

2. **An elevator is on the twentieth floor. It goes down 11 floors and then up 5 floors. What floor is the elevator on now?**

Sol : Present location of the elevator = 20th floor

If it goes down 11 floor $\Rightarrow$ (– 11)

= 20 + (–11) = 9th floor

If it goes up 5 floor $\Rightarrow$ 9 + 5

= 14th floor

3. **16 + __ = 16. The property expressed here is _____.**

Sol : 16 + _0_ = 16.

0 is the additive identity on integers.

SUBTRACTION OF INTEGERS

TRY THESE

(Text book Page No. 11)

1. **Do the following by using number line.**

(i) (–4) – (+3)

Sol : We start at zero facing positive direction move 4 units backward to represent (–4). Then turn towards negative side and move 3 units forward.

We reach –7.

$\therefore$ (–4) – (+3) = –7.
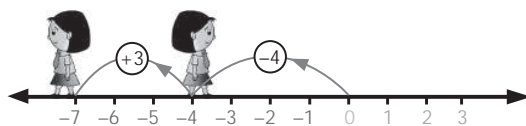
(ii) (–4) – (–3)

Sol : We start at zero facing positive direction. Move 4 units backward to represent –4. Then turn towards the negative side and move 3 units backwards.

We reach at –1.

$\therefore$ (–4) – (–3) = –1.
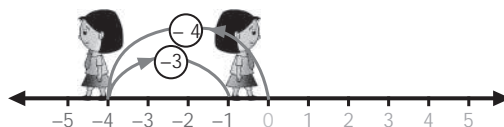
2. **Find the values and compare the answers.**

(i) (–6) – (–2) and (–6) + 2

Sol : (–6) – (–2) = –6 + (Additive inverse of –2)

= –6 + (+2) = –4

Also (–6) + 2 = –4

$\therefore$ (–6) – (–2) $\boxed{=}$ (–6) + 2

(ii)   35 – (–7) and 35 + 7.

Sol :   35 – (–7) = 35 + (Additive inverse of –7) = 35 + (+7) = 42

Also 35 + 7   =   42 ; 35 – (–7)   = 35 + 7

(iii) 26 – (+10) and 26 + (–10)

Sol :   26 – (+10) = 26 + (Additive inverse of +10) = 26 + (–10) = 16

Also 26 + (–10)   =   16 ; 26 – (+10) = 26 + (–10)

3. **Put the suitable symbol <, > or = in the boxes.**

(i)   –10 – 8 $\boxed{<}$ –10 + 8   **Sol :** –10 – 8   = –18 & –10 + 8 = –2

(ii)   (–20) + 10 $\boxed{=}$ (–20) – (–10)   **Sol :** (–20) + 10 = –10 & (–20) – (–10) = –10

(iii) (–70) – (–50) $\boxed{>}$ (–70) – 50   **Sol :** –70 – 50   = (–70) + (–50) = –120

(iv) 100 – (+100) $\boxed{<}$ 100 – (–100)   **Sol :** 100 – (+100) = 0 & 100 – (–100) =

$$100 + (+100) = 200$$

(v)   –50 – 30 $\boxed{=}$ –100 + 20   **Sol :** –50 – 30   = –50 + (–30) = –80

Also –100 + 20 = –80

🙌 TRY THESE

1. **Fill in the blanks.**

(i)   (–7) – (–15)   = **+8**   –7 – (–15) = –7 + (Additive inverse of –15)

= –7 + 15 = +8

(ii) 12 – **(–7)**   = 19   12 – (–7) = 19

(iii) **–4** – (–5)   = 1

2. **Find the values and compare the answers.**

(i)   15 – 12 and 12 – 15   (ii)   –21 – 32 and –32 – (–21)

Sol : (i) 15 – 12 = 3 & 12 – 15 = 12 + (–15) = –3

15 – 12 $\boxed{>}$ 12 – 15

(ii)   –21 – 32   =   (–21) + (–32) = –53

Also –32 –(–21)   =   (–32) + (+21) = –11 ; –53 < –11

–21 – 32 $\boxed{<}$ (–32) – (–21)

💡 Think

1. **Is associative property true for subtraction of integers. Take any three examples and check.**

Sol : Consider the numbers 1, 2 and 3. Now (1–2) – 3 = –1 – 3 = –4

Also 1 – (2 –3) = 1 – (–1) = 1 + 1 = 2

∴   (1 – 2) – 3 ≠ 1 – (2 – 3)

∴   Associative property is not true for subtraction of integers.

11

Exercise 1.2

1. Fill in the blanks.

(i) $-44 +$ ___ $= -88$ **[Ans: –44]**

(ii)   __ $- 75 = -45$ **[Ans: 30]**

(iii) __ $- (+50) = -80$ **[Ans: –30]**

2. Say True or False.

(i) $(-675) - (-400) = -1075$ **[Ans: False]**

(ii) $15 - (-18)$ is the same as $15 + 18$ **[Ans: True]**

(iii) $(-45) - (-8) = (-8) - (-45)$ **[Ans: False]**

**3. Find the value of the following.**

(i) $-3 - (-4)$ using number line.

Sol : We start at zero facing positive direction. Move 3 units backward to represent (-3). Then turn towards the negative side and move 4 units backwards. We reach $+1$. $\therefore (-3) - (-4) = +1$.
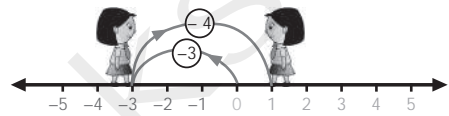
(ii) $7 - (-10)$ using number line

Sol :
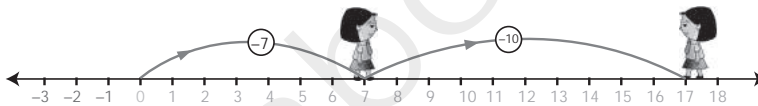
We start at zero facing positive direction. Move 7 units forward to represent $(+7)$. Then turn towards the negative side and move 10 units backwards. We reach $+17$

$\therefore 7 - (-10) = +17$

(iii) $35 - (-64)$

Sol : $35 - (-64) = 35 +$ (Additive inverse of -64) $= 35 + (+64) = 99$

$\therefore 35 - (-64) = 99$

(iv) $-200 - (+100)$

Sol : $-200 - (+100)$ $= -200 +$ (Additive inverse of $+100$) $= -200 + (-100) = -300$

$-200 - (+100) = -300$

4. Kabilan was having 10 pencils with him. He gave 2 pencils to senthil and 3 to Karthick. Next day his father gave him 6 more pencils, from that he gave 8 to his sister. How many pencils are left with him?

Sol :

Total pencils Kabilan had $= 10$

No. of pencils given to Senthil $= 2$

No. of pencils given to Karthick $= 3$.

Now number of pencils left with Kabilan $= 10 - 2 - 3 = 8 - 3 = 5$

Number of pencils got from his father $= 6$

No. total pencils Kabilan had $= 5 + 6 = 11$

Number of pencils given to his sister $= 8$

Number of pencils left with Kabilan $= 11 - 8 = 3$

5. **A lift is on the ground floor. If it goes 5 floors down and then moves up to 10 floors from there, then in which floor will the lift be?**

Sol : Initially the lift will be in the ground floor representing '0'

It goes to 5 floors down $\Rightarrow$ –5

Then it moves 10 floors up $\Rightarrow$ +10.

Now the lift will be $= 0 - 5 + 10 = -5 + 10$

$= 5^{th}$ floor (above the ground floor)

6. **When Kala woke up, her body temperature was 102°F. She took medicine for fever. After 2 hours it was 2°F lower. What was her temperature then?**

Sol : Kala's temperature initially = 102°F

After two hours the temperature decreased = –2°F

Now the final temperature = 102°F – 2°F = 100°F

7. **What number should be added to (–17) to get –19?**

Sol : According to the problem = –17 + A number = –19

The number = –19 + 17 = –2

∴ –2 should be added to –17 to get –19

8. **A student was asked to subtract (–12) from –47. He got –30. Is he correct? Justify.**

Sol : Subtracting –12 from –47, we get

–47 – (–12) = –47 + (Additive inverse of –12)

= –47 + (+12) = –35

But the students answer is –30.

So he is not correct.

OBJECTIVE TYPE QUESTIONS

9. **(–5) – (–18)**
   (i) 23   (ii) –13   (iii) 13   (iv) –23

   [Ans : (iii) 13]

10. **(–100) – 0 + 100 = _____**
    (i) 200   (ii) 0   (iii) 100   (iv) –200

    [Ans : (ii) 0]

ADDITIONAL QUESTIONS

1. **Roman civilization began in 509 BC and ended in 476 AD. How long did Romans civilization last.**

Sol : From the start of common era no. of years upto 476 AD = 476

From 509 BC to start of common era years = 509

Total years Roman civilization last = 476 + 509 = 985 years.

2. A submarine was situated 450 feet below sea level. If it descends 300 feet. What is its new position?

Sol : Position of submarine = –450 ft.

Again it descends 300 feet ⇒ –300 feet

∴ New position = –450 + (–300) = –750 ft.

∴ It was 750 feet below sea level.

3. In January the high temperature recorded was 90°F and the low temperature was –2°F. Find the difference between the high and the low temperatures?

Sol : The high temperature recorded = 90°F

The low temperature recorded = –2°F

Difference = 90°F – (–2°F)

= 90°F + (Additive inverse of –2°F)

= 90°F + (+2°F) = 92°F

MULTIPLICATION OF INTEGERS

TRY THESE

1. Find the product of the following

(i) (–20) × (–45) = **+900** [As we know the product of two negative integers is positive, the answer is +900.]

(ii) (–9) × (–8) = **72** [∵ Product of two negative integers is positive]

(iii) (–30) × 40 × (–1) = **(+1200)** [Product of two integers with opposite sings is negative integer.

(–30) × 40 × (–1) = (–1200) × (–1) = +1200)]

(iv) (–50) × 2 × (–10) = **–1000** [Product of two integers with opposite signs is negative.

(+50) × 2 × (–10) = 100 × (–10) = –1000)]

2. Complete the following table by multiplying the integers in the corresponding row and column headers.

X	–3	–2	–1	0	1	2	3
–3							
–2							
–1							
0							
1							
2							
3							

Sol : We know that (i) product of two positive integers is positive

(ii) product of two negative integers is positive

(iii) product of integers with opposite sign is negative.

∴ The table will be as follows:

Term I

X	–3	–2	–1	0	1	2	3
–3	+9	+6	+3	0	–3	–6	–9
–2	+6	+4	+2	0	–2	–4	–6
–1	+3	+2	+1	0	–1	–2	–3
0	0	0	0	0	0	0	0
1	–3	–2	–1	0	1	2	3
2	–6	–4	–2	0	2	4	6
3	–9	–6	–3	0	3	6	9

3. Which of the following is incorrect?

(i) $(-55) \times (-22) \times (-33) < 0$ (ii) $(-1521) \times 2511 < 0$

(iii) $2512 - 1525 < 0$ (iv) $(1981) \times (+2000) < 0$

Sol : (iii) and (iv) are incorrect because $2512 – 1252$ is a positive integer.

Also $(+1981) \times (+2000)$ is a positive integer.

TRY THESE

1. Find the product and check for equality

(i) $18 \times (-5)$ and $(-5) \times 18$

Sol : Here $18 \times (-5) = -90$ Also $(-5) \times 18 = -90$

$\therefore 18 \times (-5) = (-5) \times 18$

(ii) $31 \times (-6)$ and $(-6) \times 31$

Sol : Here $31 \times (-6) = -186$ Also $(-6) \times 31 = -186$

$\therefore 31 \times (-6) = (-6) \times 31$

(iii) 4×51 and 51×4

Sol : Here $4 \times 51 = 204$ Also $51 \times 4 = 204$

$\therefore 4 \times 51 = 51 \times 4$

2. Prove the following.

(i) $(-20) \times (13 \times 4) = [(-20) \times 13] \times 4$

Sol : LHS $= (-20) \times (13 \times 4) = (-20) \times 52 = -1040$

RHS $= [(-20) \times 13] \times 4 = (-260) \times 4 = -1040$

LHS = RHS

$\therefore (-20) \times (13 \times 4) = [(-20) \times 13] \times 4$

(ii) $[(-50) \times (-2)] \times (-3) = (-50) \times [(-2) \times (-3)]$

Sol : LHS $= [(-50) \times (-2)] \times (-3) = 100 \times (-3) = -300$

RHS $= (-50) \times [(-2) \times (-3)] = (-50) \times 6 = -300$

LHS = RHS

$\therefore$ $[(-50) \times (-2)] \times (-3) = (-50) \times [-2) \times (-3)]$

(iii) $[(-4) \times (-3)] \times (-5) = (-4) \times [(-3) \times (-5)]$

Sol : LHS $= [(-4) \times (-3)] \times (-5) = 12 \times (-5) = -60$

RHS $= (-4) \times [(-3) \times (-5)] = (-4) \times 15 = -60$

LHS = RHS

$\therefore [(-4) \times (-3)] \times (-5) = (-4) \times [(-3) \times (-5)]$

🙌 TRY THESE   (Text book Page No. 19)

1. Find the values of the following and check for equality:

(i) $(-6) \times (4 + (-5))$ and $((-6) \times 4) + ((-6) \times (-5))$

Sol : $(-6) \times (4 + (-5)) = (-6) \times (-1) = 6$

$((-6) \times 4) + ((-6) \times (-5)) = (-24) + 30 = 6$

Hence $(-6) \times (4 + (-5)) = ((-6) \times 4) + ((-6) \times (-5))$

(ii) $(-3) \times [2 + (-8)]$ and $[(-3) \times 2] + [(-3) \times 8]$

Sol : $(-3) \times [2 + (-8)] = (-3) \times (-6) = 18$

Also $[(-3) \times 2] + [(-3) \times 8] = (-6) + (-24) = -30$

$(-3) \times [2 + (-8)] \neq [(-3) \times 2] + [(-3) \times 8]$

2. Prove the following.

(i) $(-5) \times [(-76) + 8] = [(-5) \times (-76)] + [(-5) \times 8]$

Sol : LHS $= (-5) \times [(-76) + 8] = (-5) \times (-68)$

$= +340$

RHS $= [(-5) \times (-76)] + [(-5) \times 8]$

$= +380 + (-40) = +380 - 40 = +340$

LHS = RHS

$\therefore$ $(-5) \times [(-76) + 8] = [(-5) \times (-76)] + [(-5) \times 8]$

(ii) $42 \times [7 + (-3)] = (42 \times 7) + [42 \times (-3)]$

Sol : LHS $= 42 \times [7 + (-3)]$

$= 168$

RHS $= (42 \times 7) + [42 \times (-3)] = 294 - 126$

$= 168$

LHS = RHS

$\therefore$ $42 \times [7 + (-3)] = (42 \times 7) + [42 \times (-3)]$

(iii) $(-3) \times [(-4) + (-5)] = [(-3) \times (-4)] + [(-3) \times (-5)]$

Sol :   LHS $= (-3) \times [(-4) + (-5)] = (-3) \times (-9)$
                 $= +27$
           RHS $= [(-3) \times (-4)] + [(-3) \times (-5)] = 12 + 15 = 27$
           LHS $=$ RHS

∴ $(-3) \times [(-4) + (-5)] = [(-3) \times (-4)] + [(-3) \times (-5)]$

(iv) $103 \times 25 = (100 + 3) \times 25 = (100 \times 25) + (3 \times 25)$

Sol :   First consider $103 \times 25 = 2575$
          Now $(100 + 3) \times 25 = 103 \times 25 = 2575$
          Also $(100 \times 25) + (3 \times 25) = 2500 + 75$
                       $= 2575$

       All the three are same.

∴ $103 \times 25 = (100 + 3) \times 25 = (100 \times 25) + (3 \times 25)$

EXERCISE 1.3

1. Fill in the blanks.

   (i) $-80 \times \_\_ = -80$ **[Ans: 1]**

   (ii) $(-10) \times \_\_ = 20$ **[Ans: –2]**

   (iii) $100 \times \_\_ = -500$ **[Ans: –5]**

   (iv) $\_\_ \times (-9) = -45$ **[Ans: 5]**

   (v) $\_\_ \times 75 = 0$ **[Ans: 0]**

2. Say True or False:

   (i) $(-15) \times 5 = 75$ **[Ans: False]**

   (ii) $(-100) \times 0 \times 20 = 0$ **[Ans: True]**

   (iii) $8 \times (-4) = 32$ **[Ans: False]**

3. What will be the sign of the product of the following:

   (i)   16 times of negative integers.

   (ii)   29 times of negative integers.

Sol : (i)   16 is an even interger.

           If negative integers are multiplied even number of times, the product is a positive integer.

           ∴ 16 times a negative integer is a <u>positive integer</u>.

   (ii)   29 times negative integer.

           If negative integers are multiplied odd number of times, the product is a negative integer. 29 is odd.

           ∴ 29 times negative integers is a <u>negative integer</u>.

Chapter -1 - Number System

4. **Find the product of**

(i) $(-35) \times 22$ **Sol :** $-35 \times 22 = -770$

(ii) $(-10) \times 12 \times (-9)$ **Sol :** $(-10) \times 12 \times (-9) = (-120) \times (-9) = +1080$

(iii) $(-9) \times (-8) \times (-7) \times (-6)$

Sol : $(-9) \times (-8) \times (-7) \times (-6) = (+72) \times (-7) \times (-6)$
$$= (-504) \times (-6) = +3024$$

(iv) $(-25) \times 0 \times 45 \times 90$ **Sol :** $(-25) \times 0 \times 45 \times 90 = 0 \times 45 \times 90 = 0 \times 90 = 0$

(v) $(-2) \times (+50) \times (-25) \times 4$ **Sol :** $(-2) \times (+50) \times (-25) \times 4 = (-100) \times -25 \times 4$
$$= 2500 \times 4 = 10,000$$

5. **Check the following for equality and if they are equal, mention the property.**

(i) $(8 - 13) \times 7$ and $8 - (13 \times 7)$

Sol :   Consider $(8 - 13) \times 7 = (-5) \times 7 = -35$

Now $8 - (13 \times 7) = 8 - 91 = -83$

$\therefore$ $(8 - 13) \times 7 \neq 8 - (13 \times 7)$

(ii) $[(-6) - (+8)] \times (-4)$ and $(-6) - [8 \times (-4)]$

Sol : $[(-6) - (+8)] \times (-4) = [(-6) + (-8)] \times (-4) = (-14) \times (-4) = +56$

Now $(-6) - [8 \times (-4)] = (-6) - (-32) = (-6) + (+32) = +26$

$\therefore$ $[(-6) - (+8)] \times (-4) \neq (-6) - [8 \times (-4)]$

(iii) $3 \times [(-4) + (-10)]$ and $[3 \times (-4) + 3 \times (-10)]$

Sol :   Consider $3 \times [(-4) + (-10)] = 3 \times -14 = -42$

Now $[3 \times (-4) + 3 \times (-10)] = (-12) + (-30) = -42$

Here $3 \times [(-4) + (-10)] = [3 \times (-4) + 3 \times (-10)]$

It is the distributive property of multiplication over addition.

6. **During summer, the level of the water in a pond decreases by 2 inches every week due to evaporation. What is the change in the level of the water over a period of 6 weeks?**

Sol :   Level of water decreases a week = 2 inches.

Level of water decreases in 6 weeks = $6 \times 2 = 12$ inches

7. **Find all possible pairs of integers that give a product of –50.**

Sol : Factor of 50 are 1, 2, 5, 10, 25, 50.

Possible pairs of integers that gives product –50:

$(-1 \times 50), (1 \times (-50)), (-2 \times 25), (2 \times (-25)), (-5 \times 10), (5 \times (-10))$

$$\begin{array}{r|l} 2 & 50 \\ \hline 5 & 25 \\ \hline & 5 \end{array}$$

OBJECTIVE TYPE QUESTIONS

8. **Which of the following expressions is equal to –30.**

  (i) $-20 - (-5 \times 2)$ (ii) $(6 \times 10) - (6 \times 5)$

  (iii) $(2 \times 5) + (4 \times 5)$ (iv) $(-6) \times (+5)$ **[Ans : (iv) $(-6) \times (+5)$]**

Hint: (i) $-20 + (10) = -10$ (ii) $60 - 30 = 30$

    (iii) $10 + 20 = 30$ (iv) $(-6) \times (+5) = -30$

9. **Which property is illustrated by the equation: $(5 \times 2) + (5 \times 5) = 5 \times (2 + 5)$**

  (i) commutative   (ii) closure

  (iii) distributive   (iv) associative   **[Ans : (iii) distributive]**

10. **$11 \times (-1) =$ _____**

  (i) -1 (ii) 0   (iii) $+1$ (iv) -11

                                          [Ans : (iv) -11]

11. **$(-12) \times (-9) =$ _____**

  (i) 108   (ii) -108 (iii) $+1$ (iv) -1**[Ans : (i) 108]**

ADDITIONAL QUESTIONS

1. **Ani is scuba diving. She descends 5 feet below sea level. She descends the same distance 4 more times. What is Anis final elevation?**

Sol : Ani descends 5 feet below sea level once she descends 4 more times

        $\therefore$ She descends $(5 \times 4) + 5$ feet in total $= 20 + 5 = 25$ feet below sea level

2. **The price of a plant reduced ₹ 6 per week for 7 weeks. By how much did the price of the plant change over the 7 weeks?**

Sol : The price of plant reduced in a week = ₹ 6

    $\therefore$ The price reduced in 7 weeks = $7 \times 6 = 42$

3. **The product of three integers is –3. Determine all of the possible values for the three factors?**

Sol : Product of three integers = -3

    Possible factors are $(1 \times -1 \times 3)$, $(-1 \times -1 \times -3)$, $(1 \times 1 \times -3)$

DIVISION OF INTEGERS

✋ TRY THESE

                                        (Text book Page No. 22)

(i) $(-32) \div 4 =$ _____   **[Ans: –8]**

(ii) $(-50) \div 50 =$ _____   **[Ans: –1]**

(iii) $30 \div 15 =$ _____   **[Ans: 2]**

(iv) $-200 \div 10 =$ _____   **[Ans: –20]**

(v) $-48 \div 6 =$ _____   **[Ans: –8]**

EXERCISE 1.4

1. **Fill in the blanks.**

(i) $(-40) \div$ _____ $= 40$ **[Ans: –1]**

(ii) $25 \div$ _____ $= -5$ **[Ans: –5]**

(iii) _____ $\div (-4) = 9$ **[Ans: –36]**

(iv) $(-62) \div (-62) =$ _____   **[Ans: 1]**

2. **Say True or False:**

(i) $(-30) \div (-6) = -6$ **[Ans: False]**

(ii) $(-64) \div (-64)$ is 0   **[Ans: False]**

3. **Find the values of the following.**

(i) $(-75) \div 5$ **Sol :** $\dfrac{-75}{5} = -15$

(ii) $(-100) \div (-20)$ **Sol :** $\dfrac{-100}{-20} = 5$

(iii) $45 \div (-9)$ **Sol :** $\dfrac{45}{-9} = -5$

(iv) $(-82) \div 82$ **Sol :** $\dfrac{-82}{82} = -1$

4. **The product of two integers is –135. If one number is –15. Find the other integer.**

Sol : Given the product of two integers $= -135$

One of them $= -15$

$\therefore \quad -15 \times$ Another number $= -135$

Other number $= \dfrac{-135}{-15} = 9$

$\therefore \quad$ The other number $= 9$.

5. **In 8 hours duration, with uniform decrease in temperature, the temperature dropped 24°. How many degrees did the temperature drop each hour?**

Sol : In 8 hours the drop in temperature $= 24$

In 1 hour the drop in temperature $= \dfrac{24}{8} = 3°$

The temperature dropped 3° every hour.

6. **An elevator descends into a mine shaft at the rate of 5 m/min. If the descent starts from 15 m above the ground level, how long will it take to reach –250 m?**

Sol : The elevator's position $= 15$ m above ground level $= +15$ m

It should reach $= -250$ m

The distance to be travelled $= 15 - (-250)$ m $= 15 + (+250)$ m $= 265$ m

Time taken to descend 5 m $= 1$ min

$\therefore$ Time required to descend 265 m $= \dfrac{265\ m}{5\ m} = 53$ min

7. **A person lost 4800 calories in 30 days. If the calory loss is uniform, calculate the loss of calory per day.**

Sol : Loss of calory in 30 days $= 4800$

∴ Loss of calory in 1 day $= \dfrac{4800}{30} = 160$ calories

∴ 160 calories lost per day.

8. **Given $168 \times 32 = 5376$ then find $(-5376) \div (-32)$.**

Sol : Given $168 \times 32 = 5376$

∴ $\dfrac{5376}{32} = 168$

Also $\dfrac{-5376}{-32} = 168$

9. **How many -4's are there is (-20)?** **Sol:** Number of -4's in $(-20) = \dfrac{-20}{-4} = 5$

10. **(-400) divided into 10 equal parts gives _____** **Sol :** $\dfrac{-400}{10} = -40$

OBJECTIVE TYPE QUESTIONS

11. **Which of the following does not represent an integer?**

(i) $0 \div (-7)$ (ii) $20 \div (-4)$ (iii) $(-9) \div 3$ (iv) $12 \div 5$

[Ans: (iv) $12 \div 5$]

12. **$(-16) \div 4$ is the same as**

(i) $-(-16 \div 4)$ (ii) $-(16) \div (-4)$ (iii) $16 \div (-4)$ (iv) $-4 \div 16$

[Ans: (iii) $16 \div (-4)$]

13. **$(-200) \div 10$ is**

(i) 20 (ii) -20 (iii) -190 (iv) 210

[Ans: (ii) -20]

14. **The set of integers is not closed under**

(i) Addition   (ii) Subtraction   (iii) Multiplication   (iv) Division

[Ans: (iv) Division]

Statement Problems on Integers using all Fundamental Operation

EXERCISE 1.5

1. **One night in Kashmir, the temperature is $-5°C$. Next day the temperature is $9°C$. What is the increase in temperature?**

Sol : Temperature in the first day $= -5°C$

Temperature in the next day $= 9°C$

∴ Increase in temperature $= 9°C - (-5°C)$

$= 9°C + (+5°C) = 14°C$

2. **An atom can contain protons which have a positive charge (+) and electrons which have a negative charge (–). When an electron and a proton pair up, they become neutral (0) and cancel the charge out. Now determine the net charge:**

(i)   5 electrons and 3 protons → –5 + 3 = –2 that is 2 electrons ⊝⊝

(ii) 6 protons and 6 electrons →

(iii) 9 protons and 12 electrons →

(iv) 4 protons and 8 electrons →

(v) 7 protons and 6 electrons →

Sol : (ii) 6 protons and 6 electrons → (+6) + (–6) = 0

(iii) 9 protons and 12 electrons → (+9) + (–12) = 9 – 12 = – 3 ⇒ 3 electrons
⊝⊝⊝

(iv) 4 protons and 8 electrons → (+4) + (–8) = +4 – 8 = –4 ⇒ 4 electrons
⊝⊝⊝⊝

(v) 7 protons and 6 electrons → (+7) + (–6) = +1 ⇒ 1 proton ⊕

3. **Scientists use the Kelvin scale (K) as an alternative temperature scale to degrees celsius (°C) by the relation T°C = (T + 273)K. Convert the following to Kelvin:**

(i) –275°C   (ii) 45°C   (iii) –400°C   (iv) – 273°C

Sol : (i)   –275°C = (–275 + 273)K = –2K

(ii) 45°C   = (45 + 273)K   = 318 K

(iii) –400°C = (–400 + 273) K = –127 K

(iv) –273°C = (–273 + 273) K = 0K.

4. **Find the amount that is left in the student's bank account, if he has made the following transaction in a month. His initial balance is ₹ 690.**

(i)   Deposit (+) of ₹ 485

(ii) Withdrawal (–) of ₹ 500

(iii) Withdrawal (–) of ₹ 350

(iv) Deposit (+) of ₹ 89

(v) If another ₹ 300 was withdrawn, what would the balance be?

Sol : (i) Initial balance of student's account = ₹ 690

Deposited amount = ₹ 485 (+)

∴   Amount left in the account = ₹ 690 + ₹ 485 = ₹ 1175

(ii) Balance in the account = ₹ 1175

Amount withdrawn = ₹ 500 (–)

Amount left = ₹ 1175 – ₹ 500 = ₹ 675

(iii) Balance in the account = ₹ 675

Amount withdrawn = ₹ 350 (–)

Amount left = ₹ 675 – ₹ 350 = ₹ 325

(iv) Balance in the account = ₹ 325

Amount deposited = ₹ 89(+)

Amount left = ₹ 325 + ₹ 89 = ₹ 414

(v) Balance in the account = ₹ 414

Amount withdrawn = ₹ 300 (–)

Amount left = ₹ 414 – ₹ 300 = ₹ 114

5. **A poet Tamizh Nambi lost 35 pages of his 'lyrics' when his file had got wet in the rain. Use integers, to determine the following.**

(i) If Tamil Nambi wrote 5 pages per day, how many day's work did he lose?

(ii) If four pages contained 1800 characters, (letters) how many characters were lost?

(iii) If Tamil Nambi is paid ₹ 250 for each page produced, how much money did he lose?

(iv) If Kavimaan helps Tamizh Nambi and they are able to produce 7 pages per day, how many days will it take to recreate the work lost?

(v) Tamizh Nambi pays Kavimann ₹ 100 per page for his help. How much money does Kavimaan receive?

Sol : (i) Total pages lost = 35

One day work = 5 page

35 pages = $\dfrac{35}{5}$ = 7 days work

∴ 7 day's work he lost.

(ii) Number of characters in four pages = 1800

Number of characters in one page = $\dfrac{1800}{4}$ = 450

∴ Number of characters in 35 pages = 450 × 35

= 15,750 characters

(iii) Payment for one page = ₹ 250

∴ Payment for 35 pages = ₹ 250 × ₹ 35

= ₹ 8,750

(iv) Number of pages recreated a day = 7

∴ To recreate 35 pages day's needed = $\dfrac{35}{7}$ = 5 days

(v) Payment of Kavimaan = ₹ 100 per page

∴ for 35 pages payment = ₹ 100 × 35 = ₹ 3,500

Chapter -1 - Number System

6. **Add 2 to me. Then multiply by 5 and subtract 10 and divide now by 4 and I will give you 15! Who am I?**

Sol : According to the problem $\{[(I + 2) \times 5] - 10\} \div 4 = 15$

$$\{[(I + 2) \times 5] - 10\} = 15 \times 4 = 60 \qquad (I + 2) \times 5 = 60 + 10 = 70$$

$$I + 2 = \frac{70}{5} = 14 \qquad\qquad I = 14 - 2 \; ; \; I = 12$$

7. **Kamatchi, a fruit vendor sells 30 apples and 50 pomegranates. If she makes a profit of ₹ 8 per apple and loss ₹ 5 per pomegranate. What will be her overall profit or loss?**

Sol :

$$\begin{aligned}
\text{Number of apples Kamatchi sold} &= 30 \\
\text{Profit per apple} &= ₹\ 8(+) \\
\therefore \qquad \text{Profit for 30 apples} &= 30 \times 8 = ₹\ 240 \\
\text{Number of pomegranates sold} &\ 50 \\
\text{Loss per pomegranate} &= ₹\ 5(-) \\
\text{Loss on selling 50 pomegranates} &= 50 \times (-5) = ₹\ -250 \\
\text{Overall loss} &= -250 + 240 = ₹\ -10
\end{aligned}$$

i.e. loss ₹ 10.

8. **During a drought, the water level in a dam fell 3 inches per week for 6 consecutive weeks. What was the change in the water level in the dam at the end of this period?**

Sol :

Water level fall per week = –3 inches

∴ Water level decrease for 6 weeks = $6 \times (-3) = -18$ inches

∴ decrease of 18 inches of water level.

9. **Buddha was born in 563 BC (BCE) and died in 483 BC (BCE). Was he alive in 500 BC (BCE)? and find his life time. (Source: Compton's Encyclopedia)**

Sol : Years in BCC (BCE) are taken as negative integers.

Buddha was born in –563

and died in –483

So he was alive in 500 BC (BCE)

Life time = $-483 - (-563) = -483 + 563 = +80$

Buddha's life time = 80 years.

EXERCISE 1.6

Miscellaneous Practice Problems

1. What should be added to –1 to get 10?

Sol : $(-1) +$ a number $= 10$

$\therefore$ The number $= 10 + 1 = 11$

2. $-70 + 20 = \boxed{} - 10$

Sol : $\text{LHS} = -70 + 20 = -50$

$\text{RHS} = \boxed{} - 10 \Rightarrow \boxed{} = -50 + 10 = -40$

$-70 + 20 = \boxed{-40} - 10$

3. Substract 94860 from (–86945)

Sol : $-86945 - (94860) = -86945 + (\text{Additive inverse of } 94860)$

$= -86945 + (-94860) = -1,81,805$

4. Find the value of $(-25) + 60 + (-95) + (-385)$

Sol : $(-25) + 60 + (-95) + (-385) = 35 + (-95) + (-385) = -60 + (-385) = -445$

5. Find the sum of $(-9999)\ (-2001)$ and (-5999).

Sol : $(-9999) + (-2001) + (-5999) = -12,000 + (-5999) = -17,999$

6. Find the product of $(-30) \times (-70) \times 15$.

Sol : $(-30) \times (-70) \times 15 = (+2100) \times 15 = 31,500$

7. Divide -72 by 8.

Sol : $\dfrac{-72}{8} = -9$

8. Find two pairs of integers whose product is $+15$.

Sol : (i) $(+3) \times (+5)$ (ii) $(-3) \times (-5)$

9. Check the following for equality.

(i) $(11 + 7) + 10$ and $11 + (7 + 10)$

(ii) $(8 - 13) \times 7$ and $8 - (13 \times 7)$

(iii) $[(-6) - (+8)] \times (-4)$ and $(-6) - [8 \times (-4)]$

(iv) $3 \times [(-4) + (-10)]$ and $[3 \times (-4) + 3 \times (-10)]$

Sol : (i) $\text{LHS} = (11 + 7) + 10 = 18 + 10 = 28$

$\text{RHS} = 11 + (7 + 10) = 11 + (17) = 28$

$\text{LHS} = \text{RHS}$

$\therefore (11 + 7) + 10 = 11 + (7 + 10)$

Term I

(ii) LHS = $(8 - 13) \times 7 = -5 \times 7 = -35$
      RHS = $8 - (13 \times 7) = 8 - 91 = -83$
      LHS ≠ RHS
      ∴ $(8 - 13) \times 7 \neq 8 - (13 \times 7)$

(iii) LHS = $[(-6) - (+8)] \times (-4) = [(-6) + (-8)] \times (-4) = (-14) \times (-4) = +56$
      RHS = $(-6) - [8 \times (-4)] = -6 - (-32) = -6 + (+32) = +26$
      LHS ≠ RHS
      ∴ $[(-6) - (+8)] \times (-4) \neq (-6) - [8 \times (-4)]$

(iv) LHS = $3 \times [(-4) + (-10)] = 3 \times (-14) = -42$
      RHS = $[3 \times (-4) + 3 \times (-10)] = (-12) + (-30) = -42$

      LHS = RHS

      $3 \times [(-4) + (-10)] = [3 \times (-4) + 3 \times (-10)]$

10. **Kalaivani had ₹ 5000 in her bank account on 01.01.2018. She deposited ₹ 2000 in January and withdrew ₹ 700 in February. What was Kalaivani's bank balance on 01.04.2018, if she deposited ₹ 1000 and withdraw ₹ 500 in March.**

Sol : Initial bank balance = ₹ 5000 ; Total deposits: January : ₹ 2000 ; March : ₹ 1000

   Total deposits upto March = ₹ 5000 + ₹ 2000 + ₹ 1000 = ₹ 8000

Amount withdrawn: February : ₹ 700 (–)

            March : ₹ 500 (–)
   ∴   Total amount withdrawn = $(-700) + (-500) = ₹ -1200$
            Net bank balance   = ₹ 8000 – ₹ 1200 = ₹ 6800

11. **The price of an item x increases by ₹ 10 every year and an item y decreases by ₹ 15 every year. If in 2018, the price of x is ₹ 50 and y is ₹ 90, then which item will be costlier in the year 2020?**

Sol : Amount increases for x every year = ₹ 10.

   Price of x in 2018 = ₹ 50 ; Price of x in 2019 = ₹ 50 + ₹ 10 = ₹ 60

   Price of x in 2020 = ₹ 60 + ₹ 10 = ₹ 70   Amount decreases for y per year = ₹ 15

   Price of y in 2018 = ₹ 90

   Price of y in 2019 = ₹ 90 – ₹ 15 = ₹ 75

   Price of y in 2020 = ₹ 75 – ₹ 15 = ₹ 60

   Here 70 > 60. ∴ Item x will costlier in year 2020.

Term I

12. **Match the statements in Column A and Column B.**

S.No.	A	B
(ı)	For any two integers 72 and 108, 72 + 108 is also an integer	(a) Distributive property of multiplication over addition.
(ıı)	For any three integers 68, 25 and 99 $68 \times (25 + 99) = (68 \times 25) + (68 \times 99)$	(b) Multiplicative identity
(ııı)	$0 + (-138) = (-138) = (-138) + 0$	(c) Commutative property under multiplication.
(ıῶ)	For any two integers (–5) and 10 $(-5) \times 10 = 10 \times (-5)$	(d) Closed under addition
(ῶ)	$1 \times (-1098) = (-1098) = (-1098) \times 1$	(e) Additive identify.

[Ans: i - d, ii - a, iii - e, iv - c, v - b]

CHALLENGE PROBLEMS

13. **Say True or False.**
   (i)   The sum of a positive integer and a negative integer is always a positive integer.   **[Ans: False]**
   (ii)   The sum of two integers can never be zero   **[Ans: False]**
   (iii) The product of two negative integers is a positive integer.   **[Ans: True]**
   (iv)   The quotient of two integers having opposite sign is a negative integer.
                                                                             [Ans: True]
   (v)   The smallest negative integer is –1.   **[Ans: False]**

14. **An integer divided by 7 gives a quotient –3. What is that integer?**

Sol :   According to the problem $\dfrac{\text{An integer}}{7} = -3$

                ∴   The integer $= -3 \times 7$

                The required integer $= -21$.

15. **Replace the question mark with suitable integer in the equation.**

$72 + (-5) - \boxed{?} = 72$

Sol :

$$72 + (-5) - \boxed{?} = 72$$
$$67 - \boxed{?} = 72$$
$$- \boxed{?} = 72 - 67 = 5$$
$$\boxed{?} = -5$$

∴ $72 + (-5) - \boxed{-5} = 72$

16. Can you give 10 pairs of single digit integers whose sum is zero?

Sol : $1 + (–1) + 2 + (–2) + 3 + (–3) + 4 + (–4) + 5 + (–5) = 0$

17. If P = –15 and Q = 5 find (P – Q) ÷ (P + Q).

Sol : Given P = 15 ; Q = 5

$$(P – Q) ÷ (P + Q) = \frac{(-15)-5}{(-15)+5} = \frac{(-15)+(-5)}{-10} = \frac{-20}{-10} = 2$$

18. If the letters in the English alphabets A to M represent the number from 1 to 13 respectively and N represents 0 and the letters O to Z correspond from –1 to –12, find the sum of integers for the names given below. For example,

MATH → Sum → 13 + 1 – 6 + 8 = 16

(i) YOUR NAME   (ii) SUCCESS

Sol : Given

A	B	C	D	E	F	G	H	I	J	K	L	M
1	2	3	4	5	6	7	8	9	10	11	12	13
N	O	P	Q	R	S	T	U	V	W	X	Y	Z
0	–1	–2	–3	–4	–5	–6	–7	–8	–9	–10	–11	–12

(i) My name LEENA → 12 + 5 + 5 + 0 + 1 = 23

(ii) SUCCESS → (–5) + (–7) + 3 + 3 + 5 + (–5) + (–5)

= –12 + 6 + 5 + (–10) = –6 + 5 + (–10) = (–1) + (–10) = –11

19. From a water tank 100 litres of water is used every day. After 10 days there is 2000 litres of water in the tank. How much water was there in the tank before 10 days?

Sol : Water used for one day = 100 litres.

Water used for 10 days = 100 × 10 = 1000 litres.

After 10 days water left in the tank = 2000 litres

∴ Initially amount of water will be = 2000 + 1000 = 3000 litres

20. A dog is climbing down into a well to drink water. In each jump it goes down 4 steps. The water level is in 20th step. How many jumps does the dog take to reach the water level?

Sol : The water in the well is at 20th step.

For each jump the dog goes low 4 steps.

∴ Number of jumps the dog to reach the water = $\frac{20}{4} = 5$ jumps

21. Kannan has a fruit shop. He sells 1 dozen banana at a loss of ₹ 2 each because it may get rotten next day. What is his loss?

Sol : 1 dozen = 12 bananas

For 1 banana loss = ₹ 2

∴ For 12 bananas loss = ₹ 2 × 12 = ₹ 24

22. **A submarine was situated at 650 feet below the sea level. If it descends 200 feet, what is its new position?**

Sol : Position of submarine = 650 feet below sea level = –650 feet

Again the depth it descends = 200 feet below = – 200 feet

∴ Position of submarine = (–650) + (–200) = –850 feet

The submarine will be 850 feet below the sea level.

23. **In a magic square given below each row, column and diagonal should have the same sum. Find the values of x, y, and z.**

1	–10	x
y	–3	–2
–6	4	z

Sol : Column total = Row total = diagonal total

$$\therefore 1 + y + (-6) = (-10) + (-3) + 4$$
$$y + (-5) = -13 + 4$$
$$y = -9 + 5$$
$$y = -4$$

So $1 + (-10) + x = y + (-3) + (-2)$
$$-9 + x = (-4) + (-3) + (-2)$$
$$-9 + x = -9$$
$$x = -9 + 9$$
$$x = 0$$

Now $x + (-2) + z = (-10) + (-3) + 4$
$$0 + (-2) + z = (-13) + 4$$
$$-2 + z = -9$$
$$z = -9 + 2 = -7$$
$$z = -7$$

$$\therefore x = 0, y = -4, z = -7$$

ADDITIONAL QUESTIONS

1. **Simplify the following using suitable properties.**

(a) $(-1650) \times (-2) + (-1650) \times (-98)$ **(b)** $(9150 \times 405) - (8150 \times 405)$

Sol :(a) $(-1650) \times (-2) + (-1650) \times (-98)$

$= 1650 [(-1) \times (-2) + (-1) \times -98] = 1650 (2 + 98)$ [Distributive property]

$= 1650 \times 100 = 1,65,000$

(b) $(9150 \times 405) - (8150 \times 405)$

$= 405 (9150 - 8150) = 405 \times 1000$

$= 4,05,000$

2. **Which is greater: $(9 + 7) \times 1000$ or $9 + 7 \times 1000$?**

Sol : $(9 + 7) \times 1000 = 16 \times 1000 = 16,000$

$9 + 7 \times 1000 = 9 + 7000 = 7,009$

$16,000 > 7009$

$\therefore$ $(9 + 7) \times 1000 > [9 + 7 \times 1000]$

3. **Simiplify: $80 \div [240 \div (-24)] + 7$**

Sol : We have

$80 \div [240 \div (-24)] + 7$

$= 80 \div \left[\dfrac{240}{-24}\right] + 7$

$= 80 \div (-10) + 7 = -\left[\dfrac{80}{10}\right] + 7 = (-8) + 7 = -1$

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⬧ Sura's ➠ 7th Std - Mathematics

UNIT TEXT

Time: 1 hrs **Max Marks : 25**

I. Choose the best answer from the options given below. **5 × 1 = 5**

1. The additive identity for integers is
   (a) –1   (b) 0   (c) 1   (d) None of these

2. When 5 is multiplied by 0 we get
   (a) 5   (b) –5   (c) 10   (d) 0

3. What is the quotient when zero is divided by a non-zero integer?
   (a) 1   (b) –1   (c) 0   (d) The integer itself

4. Name the property which says that "if two integers are added or subtracted, the answer is always an integer".
   (a) Closure property   (b) Associative property
   (c) Distributive property   (d) Identity

5. The product of 5 and –3 is
   (a) 0   (b) 15   (c) –15   (d) 8

II. Fill in the blanks **5 × 1 = 5**

6. The additive inverse of 0 is _____

7. $300 + (-300) =$ _____

8. $2 + 0 + (-15) =$ _____ $+ 0 + 2$

9. $50 \times$ _____ $= 0$

10. The product of _____ and –1 is –15.

III. Answer the following question **5 × 2 = 10**

11. If the product of two integers is –84. One of them is –6, then what is the other integer?

12. Find the product of $(-1) \times (-1) \times (-2) \times (-2)$

13. Use >, < or = in the boxes.
   (a) $(-5) + (-3)$ ☐ $(-5) - (-3)$ (b) $(-3) + 7 - (19)$ ☐ $15 - 8 + (-9)$

14. Write a negative integer and a positive integer whose difference is –4?

15. Write a pair of integers whose sum is smaller than both the integers.

IV. Answer the following $1 \times 5 = 5$

16. (a) An elevator descends into a mine shaft at the rate of 6m/min. If the descend starts from 10 m above the ground level. How long will it take to reach –350 m?

(or)

(b) Write five pairs of integers a, b such that $\dfrac{a}{b} = -3$

ANSWERS

I.

1. (b) 0

2. (d) 0

3. (c) 0

4. (a) closure property

5. (c) –15

II.

6. 0

7. 0

8. –15

9. 0

10. 15

III.

11. 14

12. 4

13. (a) <   (b) <

14. –2, 2

15. –25, 3

IV.

16. (a)   1 hour

(b)   (9, –3), (–3, 1), (–18, 6) (6, –2) (–15, 5)

❧•❧

TERM

II

CONTENTS

CHAPTER

1

NUMBER SYSTEM

Representing a Decimal Number

✦ $\dfrac{1}{10}$ (one-tenth of a unit can be written as 0.1 in decimal notation)

✦   The dot represents the decimal point and it comes between ones place and tenths place.

✦   The place value of the decimal digits of a number are tenths $\left(\dfrac{1}{10}\right)$, hundredths $\left(\dfrac{1}{100}\right)$, thousandths $\left(\dfrac{1}{1000}\right)$ and so on.

TRY THESE

1.   **Observe the following and write the fraction of the shaded portion and mention in decimal form also.**
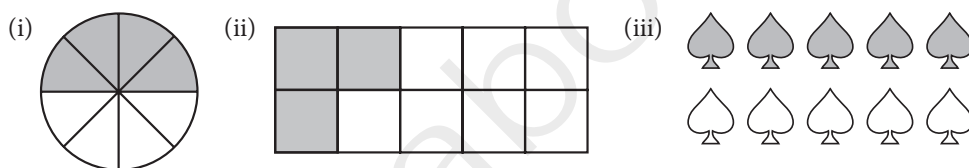
Sol : **(i)**   Total parts = 8

Shaded parts = 4

Fraction of the shaded portion = $\dfrac{4}{8}$

Decimal form of $\dfrac{4}{8}$ is 0.5

$$\begin{array}{r} 0.5 \\ 8\overline{\big)\,4.0} \\ \underline{40} \\ 0 \end{array}$$

(ii)   Total parts = 10

Shaded parts = 3

Fraction of the shaded portion = $\dfrac{3}{10}$

Decimal form of $\dfrac{3}{10}$ is 0.3

$$\begin{array}{r} 0.3 \\ 10\overline{\big)\,3.0} \\ \underline{30} \\ 0 \end{array}$$

(iii)   Total parts = 10

Shaded parts = 5

Fraction of the shaded portion = $\dfrac{5}{10}$

Decimal form of $\dfrac{5}{10}$ is 0.5

$$\begin{array}{r} 0.5 \\ 10\overline{\big)\,5.0} \\ \underline{50} \\ 0 \end{array}$$

2. **Represent the following fractions in decimal form by converting denominator into ten or powers of 10.**

S.No.	Fraction	Decimal Form
(i)	$\dfrac{3}{5}$	**Sol :** $\dfrac{3}{5} = \dfrac{3\times 2}{5\times 2} = \dfrac{6}{10} = 0.6$
(ii)	$\dfrac{4}{10}$	**Sol :** $\dfrac{4}{10} = 0.4$
(iii)	$\dfrac{2}{4}$	**Sol :** $\dfrac{2}{4} = \dfrac{2\times 25}{4\times 25} = \dfrac{50}{100} = 0.50 = 0.5$
(iv)	$\dfrac{4}{20}$	**Sol :** $\dfrac{4}{20} = \dfrac{4\times 5}{20\times 5} = \dfrac{20}{100} = 0.20 = 0.2$
(v)	$\dfrac{7}{10}$	**Sol :** $\dfrac{7}{10} = 0.7$

3. **Give any two life situations where we use decimal numbers.**

Sol : **(i)** Measuring weight of gold.

(ii) Weighing our height

TRY THIS

1. **Represent the following decimal numbers pictorially.**

(i) 5 ones and 3 tenths **(ii) 6 tenths**

(iii) 7 ones and 9 tenths **(iv) 6 ones and 4 tenths**

(v) Seven tenths

Sol : (i) 5 ones and 3 tenths

5 ones   3 tenths

(ii) 6 tenths

6 tenths

(iii) 7 ones and 9 tenths
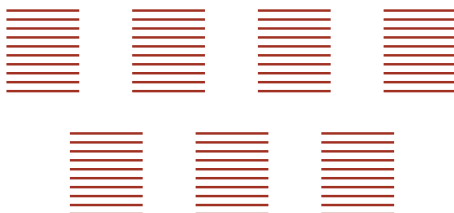
7 ones   9 tenths

(iv) 6 ones and 4 tenths
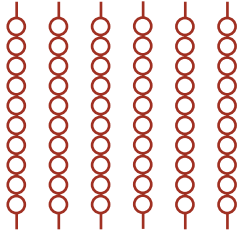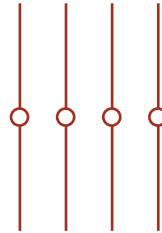
6 ones   4 tenths

(v) seven tenths
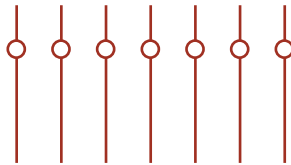
seven tenths

🙌 **TRY THESE**   **(Text book Page No. 5 &6)**

1. Express the following decimal numbers in an expanded form and place value grid form.

(i) **56.78**   **(ii)** **123.32**   **(iii)**   **354.56**

Sol : **(i)** **56.78**

   (a) Expanded form

   $56.78 = 5 \times 10^1 + 6 \times 10^0 + 7 \times 10^{-1} + 8 \times 10^{-2}$

   (b) Place value grid

56.78	Tens	Ones	Tenths	Hundredths
	5	6	7	8

(ii) **123.32**

   (a) Expanded form

   $123.32 = 1 \times 10^2 + 2 \times 10^1 + 3 \times 10^0 + 3 \times 10^{-1} + 2 \times 10^{-2}$

   (b) Place value grid

123.32	Hundreds	Tens	Ones	Tenths	Hundredths
	1	2	3	3	2

(iii) 354.56

    (a)   Expanded form

        $354.56 = 3 \times 10^2 + 5 \times 10^1 + 4 \times 10^0 + 5 \times 10^{-1} + 6 \times 10^{-2}$

    (b)   Place value grid

354.56	Hundreds	Tens	Ones	Tenths	Hundredths
	3	5	4	5	6

2. **Express the following measurements in terms of metre and in decimal form. One is done for you.**

S.No.	Measurements	In meter	Decimal form
1.	**7 m 36 cm**	**7 and 36 hundredths of a m**	7.36
2.	**26 m 50 cm**	26 and 50 hundredths of a m	26.50
3.	**93 cm**	93 hundredths of a m	0.93
4.	**36 m 60 cm**	36 and 60 hundredths of a m	36.60
5.	**126 m 45 cm**	126 and 45 hundredths of a m	126.45

3. **Write the following numbers in the place value grid and find the place value of the underlined digits.**

    (i) **36.3̲7**   **(ii)** **267.06̲**   **(iii)** **0.2̲3**   **(iv)** **27.69̲**   **(v)** **53.2̲7**

Sol :

S.No.	Hundreds	Tens	Ones	Tenths	Hundreths
1.	-	3	6	3	7
2.	2	6	7	0	6
3.	-	-	0	2	3
4.	-	2	7	6	9
5.	-	5	3	2	7

(i)   Place value of 3 in 36.3̲7 is Tenths.

(ii)   Place value of 6 in 267.06̲ is Hundredths.

(iii)   Place value of 2 in 0.2̲3 is Tenths.

(iv)   Place value of 9 in 27.69̲ is Hundredths.

(v)   Place value of 2 in 53.2̲7 is Tenths.

EXERCISE 1.1

1. Write the decimal numbers for the following pictorial representation of numbers.

(i)   (ii)
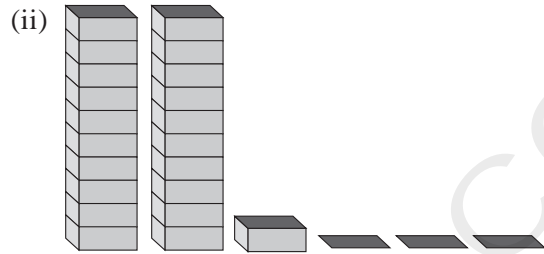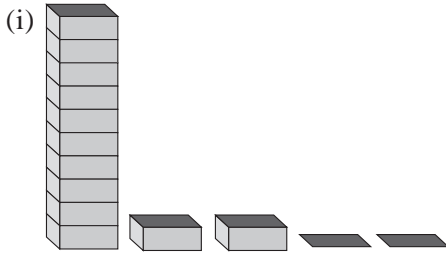
Sol : (i) 1 Tens 2 ones 2 tenths = 12.2   **(ii)** 2 Tens 1 ones 3 tenths = 21.3

2. Express the following in cm using decimals.

(i) **5 mm**   (ii) **9 mm**   (iii) **42 mm**
(iv) **8 cm 9 mm**   (v) **375 mm**

Sol : (i) 5 mm

1 mm $= \dfrac{1}{10}$ cm = 0.1 cm

5 mm $= \dfrac{5}{10}$ = 0.5 cm

(ii) 9 mm

1 mm $= \dfrac{1}{10}$ cm = 0.1 cm

9 mm $= \dfrac{9}{10}$ cm = 0.9 cm

(iii) 42 mm

1 mm $= \dfrac{1}{10}$ cm = 0.1 cm; 42 mm $= \dfrac{42}{10}$ cm = 4.2 cm

(iv) 8 cm 9 mm

1 mm $= \dfrac{1}{10}$ cm = 0.1 cm

8 cm 9 mm $=$ 8 cm $+ \dfrac{9}{10}$ cm = 8.9 cm

(v) 375 mm

1 mm $= \dfrac{1}{10}$ cm = 0.1 cm

375 mm $= \dfrac{375}{10}$ cm = 37.5 cm

Term II

3. **Express the following in metres using decimals.**

(i) **16 cm**   (ii) **7 cm**   (iii) **43 cm**

(iv) **6 m 6 cm**   (v) **2 m 54 cm**

Sol : (i)   16 cm

$$1 \text{ cm} = \frac{1}{100} \text{ cm} = 0.01 \text{ m}$$

$$16 \text{ cm} = \frac{16}{100} \text{ m} = 0.16 \text{ m}$$

(ii)   7 cm

$$1 \text{ cm} = \frac{1}{100} \text{ cm} = 0.01 \text{ m}$$

$$1 \text{ cm} = \frac{7}{100} \text{ m} = 0.07 \text{ m}$$

(iii)   43 cm

$$1 \text{ cm} = \frac{1}{100} \text{ cm} = 0.01 \text{ m}$$

$$43 \text{ cm} = \frac{43}{100} \text{ m} = 0.43 \text{ m}$$

(iv)   6 m 6 cm

$$1 \text{ cm} = \frac{1}{10} \text{ m} = 0.01 \text{ m}$$

$$6 \text{ m } 6 \text{ cm} = 6 \text{ m} + \frac{6}{100} \text{ m} = 6 \text{ m} + 0.06 \text{ m} = 6.06 \text{ m}$$

(v)   2 mm 54 cm

$$1 \text{ cm} = \frac{1}{100} \text{ cm} = 0.01 \text{ cm}$$

$$2 \text{ m } 54 \text{ cm} = 2 \text{ m} + \frac{54}{100} \text{ m} = 2 \text{ m} + 0.54 \text{ m} = 2.54 \text{ m}$$

4. **Expand the following decimal numbers.**

(i) **37.3**   (ii) **658.37**   (iii) **237.6**   (iv) **5678.358**

Sol : (i) $37.3 = 30 + 7 + \dfrac{3}{10} = 3 \times 10^1 + 7 \times 10^0 + 3 \times 10^{-1}$

(ii) $658.37 = 600 + 50 + 8 + \dfrac{3}{10} + \dfrac{7}{100}$

$$= 6 \times 10^2 + 5 \times 10^1 + 8 \times 10^0 + 3 \times 10^{-1} + 7 \times 10^{-2}$$

(iii) $237.6 = 200 + 30 + 7 + \dfrac{6}{10}$

$= 2 \times 10^2 + 3 \times 10^1 + 7 \times 10^0 + 6 \times 10^{-1}$

(iv) $5678.358 = 5000 + 600 + 70 + 8 + \dfrac{3}{10} + \dfrac{5}{100} + \dfrac{8}{1000}$

$= 5 \times 10^3 + 6 \times 10^2 + 7 \times 10^1 + 8 \times 10^0 + 3 \times 10^{-1} + 5 \times 10^{-2} + 8 \times 10^{-3}$

5. **Express the following decimal numbers in place value grid and write the place value of the underlined digit.**

(i) 53.61   **(ii) 263.271**   **(iii) 17.39**   **(iv) 9.657**

(v) 4972.068

Sol : (i) 53.61

53.6<u>6</u>1	Tens	Ones	Tenths	Hundredths	Place value of 6
	5	3	6	1	is $\dfrac{6}{10}$

(ii) 263.271

263.2<u>7</u>1	Hundreds	Tens	Ones	Tenths	Hundredths	Thousandths	Place value of 2 in 263.271 is $\dfrac{2}{10}$
	2	6	3	2	7	1	

(iii) 17.39

17.3<u>9</u>	Tens	Ones	Tenths	Hundredths	Place value of 9 in 17.3<u>9</u> is $\dfrac{9}{100}$
	1	7	3	9	

(iv) 9.657

9.6<u>5</u>7	Ones	Tenths	Hundreds	Thousandths	Place value of 5 is 9.6<u>5</u>7 is $\dfrac{5}{100}$
	9	6	5	7	

(v) 4972.068

4972.06<u>8</u>	Thou sands	Hund reds	Tens	Ones	Tenths	Hund redths	Thou sandths	Place value of 8 is 4972.068 is $\dfrac{8}{1000}$
	4	9	7	2	0	6	<u>8</u>	

Term II

Chapter -1 - Number System

OBJECTIVE TYPE QUESTIONS

6. **The place value of 3 in 85.073 is _____**

  (i) tenths   (ii) hundredths

  (iii) thousands   (iv) thousandths   **[Ans : (iv) thousandths]**

Hint: $85.073 = 8 \times 10 + 5 \times 1 + 0 \times \dfrac{1}{10} + 7 \times \dfrac{1}{100} + 3 \times \dfrac{1}{1000}$

7. **To convert grams into kilograms, we have to divide it by**

  (i) 10000   (ii) 1000   (iii) 100   (iv) 10   **[Ans : (ii) 1000]**

Hint: $1000 \text{ g} = 1 \text{ kg}; 1 = \dfrac{1}{1000} \text{ kg}$

8. **The decimal representation of 30 kg and 43 g is ____ kg.**

  (i) 30.43   (ii) 30.430   (iii) 30.043   (iv) 30.0043**[Ans:(iii) 30.043]**

Hint: $30 \text{ kg and } 43 \text{ kg} = 30 \text{ kg} + \dfrac{43}{1000} \text{ kg} = 30 + 0.043 = 30.043$

9. **A cricket pitch is about 264 cm wide. It is equal to ____ m.**

  (i) 26.4   (ii) 2.64   (iii) 0.264   (iv) 0.0264 **[Ans : (ii) 2.64]**

Hint: $264 \text{ cm} = \dfrac{264}{100} \text{ m} = 2.64 \text{ m}$

ADDITIONAL QUESTIONS

1. **Express as rupees using decimals.**

  (i) 4 paise   **(ii) 4 rupees 4 paise**

  (iii) 44 rupees 44 paise   **(iv) 50 paise**

  (v) 625 paise   **[Ans : (ii) 2.64]**

Sol : We know that 100 paise = ₹ 1

1 paise = ₹ $\dfrac{1}{100}$

  (i) 4 paise = ₹ $4 \times \dfrac{1}{100}$ = ₹ $\dfrac{4}{100}$ = ₹ 0.04

  (ii) 4 rupees 4 paise = ₹ 4 + ₹ 0.04 = ₹ 4.04

  (iii) 44 rupees 4 paise = ₹ 44 + 44 paise = ₹ 44 + ₹ $\dfrac{44}{100}$ = ₹ 44 + ₹ 0.44 = ₹ 44.44

  (iv) 625 paise = 600 paise + 25 paise = ₹ 6 + ₹ $\dfrac{25}{100}$ = ₹ 6 + ₹ 0.25 = ₹ 6.25

2. Express 7 cm in metre and kilometer.

Sol :   7 cm = $\dfrac{7}{100}$ m = 0.07 m

7 cm = $\dfrac{7}{100000}$ km = 0.00007 km

3. Write the following decimal numbers in the expanded form.
   (i)   30.04   **(ii)   3.04**   **(iii)   300.04**

Sol : (i) $30.04 = 3 \times 10 + 0 \times 1 + 0 \times \dfrac{1}{10} + 4 \times \dfrac{1}{100} = 3 \times 10 + \dfrac{4}{100}$

(ii) $3.04 = 3 \times 1 + 0 \times \dfrac{1}{10} + 4 \times \dfrac{1}{100} = 3 \times 1 + \dfrac{4}{100}$

(iii) $300.04 = 3 \times 100 + 0 \times 10 + 0 \times 1 + 0 \times \dfrac{1}{10} + 4 \times \dfrac{1}{100} = 3 \times 100 + \dfrac{4}{100}$

$= 3 \times 100 + \dfrac{4}{100}$

4. Write the place value of 2 in the following decimal numbers.
   (i)   2.47   **(ii)   26.89**   **(iii)   36.28**

Sol : (i)   2.47

Place value of 2 in 2.47 is ones.

(ii)   26.89

Place value of 2 in 26.89 is Tens.

(iii)   36.28

Place value of 2 in 36.28 is tenths.

Fractions and Decimals

✦   A decimal is a fraction written in a special form.

✦   Decimal comes from the latin word decinus which means tenth. It comes from the root word "decem".

✦   In any number when we move towards right from one digit to the next, the place value of a digit is divided by 10.

✦   If the donominator of a fraction is any of 10, 10^2, 10^3, ... , we can express them as decimals.

✦   If the denominator of a fraction is any number that can be made as powers of 10 using the concepts of equivalent fractions, then it can also be expressed as decimals.

✦   For any decimal number, number of zeroes in the denominator and number of decimal digits are equal.

Term II

💡 Think
(Text book Page No. 9)

1.   Can you express the denominators of all fractions as powers of 10?

Sol : No, we cannot.

Eg: $\dfrac{1}{3}, \dfrac{1}{7}$

TRY THESE
(Text book Page No. 10)

1.   Convert the following fractions into the decimal numbers.

(i) $\dfrac{16}{1000}$ (ii) $\dfrac{638}{10}$ (iii) $\dfrac{1}{20}$ (iv) $\dfrac{3}{50}$

Sol : (i) $\dfrac{16}{1000} = 0.016$

(ii) $\dfrac{638}{10} = 63.8$

(iii) $\dfrac{1}{20} = \dfrac{1 \times 5}{20 \times 5} = \dfrac{5}{100} = 0.05$

(iv) $\dfrac{3}{50} = \dfrac{3 \times 2}{50 \times 2} = \dfrac{6}{100} = 0.06$

2.   Write the fraction for each of the following:

(i)   6 hundreds + 3 tens + 3 ones + 6 hundredths + 3 thousandths.

(ii)   3 thousands + 3 hundreds + 4 tens + 9 ones + 6 tenths.

Sol : (i)   6 hundreds + 3 tens + 3 ones + 6 hundredths + 3 thousandths.

$= 6 \times 100 + 3 \times 10 + 3 \times 1 + 0 \times \dfrac{1}{10} + 6 \times \dfrac{1}{100} + 3 \times \dfrac{1}{1000}$

$= 600 + 30 + 3 + 0 + \dfrac{6}{100} + \dfrac{3}{1000}$

$= 633 + 0.06 + 0.003$

$= 633.063$

(ii)   3 thousands + 3 hundreds + 4 tens + 9 ones + 6 tenths.

$= 3 \times 1000 + 3 \times 100 + 4 \times 10 + 9 \times 1 + 6 \times \dfrac{1}{10}$

$= 3000 + 300 + 40 + 9 + \dfrac{6}{10}$

$= 3349 + 0.6$

$= 3349.6$

3. Convert the following decimals into fractions.

    (i)   **0.0005**   **(ii)**   **6.24**

Sol : (i) $0.0005 = \dfrac{5}{10000} = \dfrac{5 \div 5}{10000 \div 5} = \dfrac{1}{2000}$

   (ii) $6.24 = \dfrac{624}{100} = \dfrac{624 \div 4}{100 \div 4} = \dfrac{156}{25}$

EXERCISE 1.2

1. Fill in the following place value table.

S. No.	Decimal form	Hundred (100)	Tens (10)	Ones (1)	Tenths $\left(\dfrac{1}{10}\right)$	Hundredths $\left(\dfrac{1}{100}\right)$	Thousandths $\left(\dfrac{1}{1000}\right)$
1.	320.157	3	2	0	1	5	7
2.	103.709	1	0	3	7	0	9
3.	4.003	0	0	4	0	0	3
4.	360.805	3	6	0	8	0	5

2. Write the decimal numbers from the following place value table.

S. No.	Hundred (100)	Tens (10)	Ones (1)	Tenths $\left(\dfrac{1}{10}\right)$	Hundredths $\left(\dfrac{1}{100}\right)$	Thousandths $\left(\dfrac{1}{1000}\right)$	Decimal form
1.	8	0	1	5	6	2	801.562
2.	9	3	2	0	5	6	932.056
3.	0	4	7	5	0	9	47.509
4.	5	0	3	0	0	7	503.007
5.	6	8	0	3	1	0	680.310
6.	1	0	9	9	0	8	109.908

3. Write the following decimal numbers in the place value table.

    (i)   **25.178**   **(ii)**   **0.025**   **(iii)** **428.001**

    (iv) **173.178**   **(v)**   **19.54**

Sol : (i)   25.178

Tens	Ones	Tenth	Hundredths	Thousandths
2	5	1	7	8

167

(ii) 0.025

Ones	Tenths	Hundredths	Thousandths
0	0	2	5

(iii) 428.001

Hundreds	Tens	Ones	Tenths	Hundredths	Thousandths
4	2	8	0	0	1

(iv) 173.178

Hundreds	Tens	Ones	Tenths	Hundredths	Thousandths
1	7	3	1	7	8

(v) 19.54

Tens	Ones	Tenths	Hundredths
1	9	5	4

4. **Write each of the following as decimal numbers.**

(i) $20 + 1 + \dfrac{2}{10} + \dfrac{3}{100} + \dfrac{7}{1000}$

(ii) $3 + \dfrac{8}{10} + \dfrac{4}{100} + \dfrac{5}{1000}$

(iii) $6 + \dfrac{0}{10} + \dfrac{0}{100} + \dfrac{9}{1000}$

(iv) $900 + 50 + 6 + \dfrac{3}{100}$

(v) $\dfrac{6}{10} + \dfrac{3}{100} + \dfrac{1}{1000}$

Sol : **(i)** $20 + 1 + \dfrac{2}{10} + \dfrac{3}{100} + \dfrac{7}{1000} = 21 + 2 \times \dfrac{1}{10} + 3 \times \dfrac{1}{100} + 7 \times \dfrac{1}{1000} = 21.237$

(ii) $3 + \dfrac{8}{10} + \dfrac{4}{100} + \dfrac{5}{1000} = 3 + 8 \times \dfrac{1}{10} + 4 \times \dfrac{1}{100} + 5 \times \dfrac{1}{1000} = 3.845$

(iii) $6 + \dfrac{0}{10} + \dfrac{0}{100} + \dfrac{9}{1000} = 6 + 0 \times \dfrac{1}{10} + 0 \times \dfrac{1}{100} + 9 \times \dfrac{1}{1000} = 6.009$

(iv) $900 + 50 + 6 + \dfrac{3}{100} = 956 + 0 \times \dfrac{1}{10} + 3 \times \dfrac{1}{100} = 956.03$

(v) $\dfrac{6}{10} + \dfrac{3}{100} + \dfrac{1}{1000} = 6 \times \dfrac{1}{10} + 3 \times \dfrac{1}{100} + 1 \times \dfrac{1}{1000} = 0.631$

5. **Convert the following fractions into decimal numbers.**

(i) $\dfrac{3}{10}$　　　(ii) $3\dfrac{1}{2}$　　(iii) $3\dfrac{3}{5}$　(iv) $\dfrac{3}{2}$　　(v) $\dfrac{4}{5}$

(vi) $\dfrac{99}{100}$　　　(vii) $3\dfrac{19}{25}$

Sol : (i) $\dfrac{3}{10}$ $=$ 0.3

(ii) $3\dfrac{1}{2}$ $=$ $\dfrac{7}{2} = \dfrac{7 \times 5}{2 \times 5} = \dfrac{35}{10} = 3.5$

(iii) $3\dfrac{3}{5}$ $=$ $\dfrac{18}{5} = \dfrac{18 \times 2}{5 \times 2} = \dfrac{36}{10} = 3.6$

(iv) $\dfrac{3}{2}$ $=$ $\dfrac{3 \times 5}{2 \times 5} = \dfrac{15}{10} = 1.5$

(v) $\dfrac{4}{5}$ $=$ $\dfrac{4 \times 2}{5 \times 2} = \dfrac{8}{10} = 0.8$

(vi) $\dfrac{99}{100}$ $=$ 0.99

(vii) $3\dfrac{19}{25}$ $=$ $\dfrac{94}{25} = \dfrac{94 \times 4}{25 \times 4} = \dfrac{376}{100} = 3.76$

6. **Write the following decimals as fractions.**

(i) **2.5**　　　(ii) **6.4**　　　(iii) **0.75**

Sol : (i) 2.5 $=$ $2 + \dfrac{5}{10} = \dfrac{25}{10}$

(ii) 6.4 $=$ $6 + \dfrac{4}{10} = \dfrac{64}{10}$

(iii) 0.75 $=$ $0 + \dfrac{7}{10} + \dfrac{5}{100} = \dfrac{70 + 5}{100} = \dfrac{75}{100}$

7. **Express the following decimals as fractions in lowest form.**

(i) **2.34**　　　(ii) **0.18**　　　(iii) **3.56**

Sol : (i) 2.34 $=$ $2 + \dfrac{34}{100} = 2 + \dfrac{34 \div 2}{100 \div 2} = 2 + \dfrac{17}{50} = 2\dfrac{17}{50} = \dfrac{117}{50}$

(ii) 0.18 $=$ $0 + \dfrac{18}{100} = \dfrac{18 \div 2}{100 \div 2} = \dfrac{9}{50}$

(iii) 3.56 $=$ $3 + \dfrac{56}{100} = 3 + \dfrac{56 \div 4}{100 \div 4} = 3 + \dfrac{14}{25} = 3\dfrac{14}{25} = \dfrac{89}{25}$

Term II

OBJECTIVE TYPE QUESTIONS

8. $3 + \dfrac{4}{100} + \dfrac{9}{1000} = ?$

(i) 30.49   (ii) 3049   (iii) 3.0049   (iv) 3.049

Hint: $3 \times 1 + \dfrac{0}{10} + \dfrac{4}{100} + \dfrac{9}{1000} = 3.049$ **[Ans : (iv) 3.049]**

9. $\dfrac{3}{5} = $ _____

(i) 0.06   (ii) 0.006   (iii) 6   (iv) 0.6

Hint: $\dfrac{3}{5} = \dfrac{3 \times 2}{5 \times 2} = \dfrac{6}{10} = 0.6$ **[Ans : (iv) 0.6]**

10. The simplest form of 0.35 is

(i) $\dfrac{35}{1000}$ (ii) $\dfrac{35}{10}$ (iii) $\dfrac{7}{20}$ (iv) $\dfrac{7}{100}$

Hint: $0.35 = \dfrac{35}{100} = \dfrac{35 \div 5}{100 \div 5} = \dfrac{7}{20}$ **[Ans : (iii) $\dfrac{7}{20}$]**

ADDITIONAL QUESTIONS

1. **Explain the following as fractions.**

(i) **A jar containing 3.6 litres of milk.**

(ii) **A cup containing 9.63 mg of medicine.**

Sol : **(i)** $3.6 = 3 + \dfrac{6}{10} = 3 + \dfrac{3}{5} = 3\dfrac{3}{5}$ litres of milk

(ii) $9.63 = 9 + \dfrac{6}{10} + \dfrac{3}{100} = \dfrac{900 + 60 + 3}{100} = \dfrac{963}{100}$ mg of medicine.

2. **Convert into decimal.**

(i) **Three hundred three and nine hundredths.**

(ii) **Six and fifty five thousands**

Sol : **(i)** Three hundred three and nine hundredths

$= 303 + \dfrac{9}{100} = 303 + 0 \times \dfrac{1}{10} + 9 \times \dfrac{1}{100} = 303.09$

(ii) Six and fifty five thousandths

$= 6 + \dfrac{55}{1000} = 6 + \dfrac{5}{100} + \dfrac{5}{1000}$

$= 6 + \dfrac{0}{10} + \dfrac{5}{100} + \dfrac{5}{1000} = 6.055$

3. Find the decimal form of (i) $194 + 20 + 3 + \dfrac{7}{10} + \dfrac{2}{100}$

(ii) $111 + 11 + 1 + \dfrac{1}{10} + \dfrac{1}{1000}$

Sol : (i) $194 + 20 + 3 + \dfrac{7}{10} + \dfrac{2}{100} = 217 + 7 \times \dfrac{1}{10} + 2 \times \dfrac{1}{100} = 217.72$

(ii) $111 + 11 + 1 + \dfrac{1}{10} + \dfrac{1}{1000} = 123 + 1 \times \dfrac{1}{10} + 0 \times \dfrac{1}{100} + 1 \times \dfrac{1}{1000} = 123.101$

Comparison of Decimals

✦ To compare two decimal numbers, we compare the digits from left to right.
✦ The decimal number that has the greater whole number part is the greatest number.
✦ Zeros added to the right end of decimal digits do not change the value of that decimal number.

EXERCISE 1.3

1. **Compare the following decimal numbers and find out the smaller number.**
   (i) **2.08, 2.086**   (ii) **0.99, 1.9**   (iii) **3.53, 3.35**
   (iv) **5.05, 5.50**   (v) **123.5, 12.35**

Sol : (i) 2.08, 2.086

Let us take 2.080, 2.086.

Comparing 2.08 and 2.086 the whole number part, tenths place digit and the digit in the hundredths place are equal.

Comparing the digits at thousandths place we get $0 < 6$.

Therefore $2.08 < 2.086$.

Smallest number is 2.08

(ii) 0.99, 1.9

Comparing 0.99 and 1.9.

First when we compare the digit in the whole number parts we get $0 < 1$.

∴ $0.99 < 1.9$

Smallest number is 0.99

(iii) 3.53, 3.35

Comparing 3.53 and 3.35

Here the whole number parts of the given two numbers are equal.

Comparing the digits at tenths place, we get $3 < 5$.

∴ $3.35 < 3.53$

Smallest number is 3.35

Term II

(iv) 5.05, 5.50

Comparing 5.05 and 5.50

Here the whole number parts of the given two numbers are equal.

Comparing the digits at tenths place, we get $0 < 5$.

∴ $5.05 < 5.50$

Smallest number is 5.05

(v) 123.5, 12.35

Comparing 123.5 and 12.35.

Comparing the whole number parts, we get $12 < 123$

∴ $12.35 < 123.5$

Smallest number is 12.35

2. **Arrange the following in ascending order.**

(i) **2.35, 2.53, 5.32, 3.52, 3.25**   **(ii)** **123.45, 123.54, 125.43, 125.34, 125.3**

Sol : **(i)** 2.35, 2.53, 5.32, 3.52, 3.25

Comparing the whole number parts of all the numbers 5 is the greatest

and $5 > 3 > 2$.

∴ Greatest number is 5.32   ... (1)

Next 3.52 and 3.25 are equal in their whole number.

So comparing their digits in tenths place, we get $5 > 2$

So $3.52 > 3.25$

Now comparing 2.35 and 2.53 their whole number parts also equal.

∴ Comparing the digit in tenths place we get

$2.53 > 2.35$ ... (2)

Ascending order :

$2.35 < 2.53 < 3.25 < 3.52 < 5.32$

(ii) 123.45, 123.54, 125.43, 125.34, 125.3

Comparing the whole number parts we have 123 is the smallest number and two numbers 123.45 and 123.54 have same whole number part.

123.45 and 123.54 comparing their digits in the tenths place we get $4 < 5$

∴ $123.45 < 123.54$ ... (1)

Now comparing the remaining numbers

125.43, 125.34, 125.3 they all have the same whole number part.

Comparing the numbers in the tenths place we have $3 < 4$

∴ 125.43 is the greatest   ... (2)

Also tenths place value $3 = 3$ in 125.34 and 125.3

Again comparing the hundredths place value in 125.34 and 125.3, we get

$125.3 < 125.34$ ... (3)

From (1), (2) and (3) we have,

$123.45 < 123.54 < 125.3 < 125.34 < 125.43$

3. **Compare the following decimal numbers and find the greater number.**

(i) **24.5, 20.32**   (ii) **6.95, 6.59**   (iii) **17.3, 17.8**

(iv) **235.42, 235.48**   (v) **0.007, 0.07**   (vi) **4.571, 4.578**

Sol : **(i)** 24.5, 20.32

Comparing the whole number part we get 24 > 20

∴ 24.5 > 20.32

greater number is 24.5

(ii) 6.95, 6.59

Here the whole number part of given two numbers are equal.

Comparing the digits at tenths place we get 9 > 5.

∴ 6.95 > 6.59

Greater number is 6.95

(iii) 17.3, 17.8

Here the whole number part of given two numbers are equal.

Comparing the digits at tenths place we get 8 > 3.

∴ 17.8 > 17.3

Greater number is 17.8

(iv) 235.42, 235.48

Here the whole number part of given two numbers are equal.

Also the digits at tenths place also equal.

Comparing the digits at the hundredths place we get 8 > 4.

∴ 235.48 > 235.42

Greater number is 235.48

(v) 0.007, 0.07

Here the whole number part of given two numbers are equal.

Also the digits at the tenths place also equal.

∴ Comparing the the the digits at the hundredths place we get 7 > 0.

0.07 > 0.007

greater number is 0.07.

(vi) 4.571, 4.578

Here the whole number part of given two numbers are equal.

Also the digits at the tenths place and the hundredths place also equal.

Again comparing the digits in the thousandths place we get 8 > 1.

∴ 4.578 > 4.571

∴ Greater number is 4.578

Term II

4. **Arrange the given decimal numbers in descending order.**

    (i) **17.35, 71.53, 51.73, 73.51, 37.51**

    (ii) **456.73, 546.37, 563.47, 745.63, 457.71**

Sol : **(i)** 17.35, 71.53, 51.73, 73.51, 37.51

    Comparing the whole number parts of the given numbers we get

    $73 > 71 > 51 > 37 > 17$.

    Descending order:

    73.51, 71.53, 51.73, 37.51, 17.35

    (ii) 456.73, 546.37, 563.47, 745.63, 457.71

    Comparing the whole number parts of the given numbers from left to right we get

    $745 > 563 > 546 > 457 > 456$

    Descending Order:

    745.63, 563.47, 546.37, 457.71, 456.73

OBJECTIVE TYPE QUESTIONS

5. **0.009 is equal to**

    (i) 0.90   (ii) 0.090   (iii) 0.00900 (iv) 0.900   **[Ans : (iii) 0.00900]**

6. **37.70 ☐ 37.7**

    (i) =   (ii) <   (iii) >   (iv) ≠   **[Ans : (i) =]**

7. **7. 78.56 ☐ 78.57**

    (i) <   (ii) >   (iii) =   (iv) ≠   **[Ans : (i) <]**

ADDITIONAL QUESTIONS

1. **Maya bought 5 kg 300 g bananas and 3 kg 250 kg oranges. Diya bought 4 kg 800 g apples and 4 kg 150 g of mangoes. Who bought more fruits.**

Sol : Total fruits bought by Maya = 5 kg 300 g + 3 kg 250 g = 8 kg 550 g = 8.550 kg

    Total fruits Diya bought = 4 kg 800 g + 4 kg 150 g = 8 kg 950 g = 8.950 kg

    Comparing the whole number parts, they are equal.

    Comparing thet tenths place we get $9 > 5$.

    ∴ 8.950 kg > 8.550 kg

    ∴ Diya bought more fruits.

2. **Which is greater 28 km or 42.6 km.**

Sol : Comparing the whole number part $42 > 28$.

    42.6 km is greater than 28 km.

Representing Decimal Numbers on the Number line

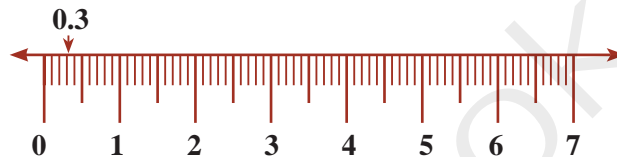## DIVISION OF INTEGERS

TRY THESE (Text book Page No. 22)

1. **Mark the following decimal numbers on the number line.**

   (i) 0.3   **(ii) 1.7**   **(iii) 2.3**

**Sol : (i)**   0.3

We know that 0.3 is more than 0, but less than 1.

There are 3 tenths in it. Divide the unit lenght between 0 and 1 on the number line into 10 equal parts and take 3 parts, which represent 0.3.

0.3

0   1   2   3   4   5   6   7

(ii)   1.7

We know that 1.7 is more than 1, but less than 2.

There are one ones and 7 tenths in it. Divide the unit length between 1 and 2 on the number line into 10 equal parts and take 7 parts which represents $1.7 = 1 + 0.7$

1.7

0   1   2   3   4   5   6   7
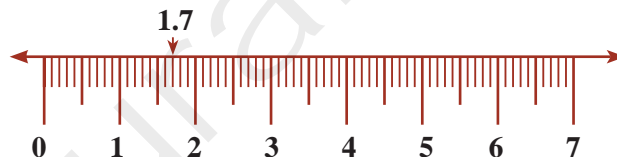
(iii) We know that 2.3 is more than 2 and less than 3.

There are 2 ones and 3 tenths in it. Divide the unit lengh between 2 and 3 into 10 equal parts and take 3 parts, which represents $2.3 = 2 + 0.3$

2.3

0   1   2   3   4   5   6   7
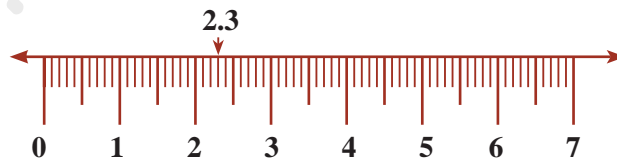
2. **Identify any two decimal numbers between 2 and 3.**

Sol : 2.5 and 2.9

3. **Write any decimal number which is greater than 1 and less than 2.**

Sol : 1.7, 1.9, 1.6,........

Term II

EXERCISE 1.4

1. **Write the decimal numbers represented by the points P, Q, R and S on the given number line.**
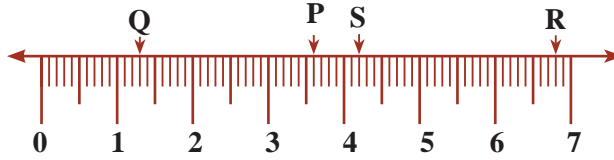
Sol : The unit length between 1 and 2 is divided into 10 equal parts and the third part is taken as Q.

∴ Q represents $1 + 0.3 = 1.3$

The unit lenth between 3 and 4 is divided into 10 equal parts and the 6th part is taken as P.

∴ P represents $3 + 0.6 = 3.6$

The unit length between 4 and 5 is divied into 10 equal parts and the second part is taken as S.

∴ S represents $4 + 0.2 = 4.2$

The unit length between 6 and 7 is divided into 10 equal parts and the 8th part is taken.

∴ R represents $6 + 0.8 = 6.8$

P(3.6), Q(1.3), R(6.8), S(4.2).

2. **Represent the following decimal numbers on the number line.**

    (i)   **1.7**   **(ii)**   **0.3**   **(iii)**   **2.1**

Sol : (i)   1.7

     We know that 1.7 is more than 1, but less than 2.

     There are one ones and 7 tenths in it. Divide the unit length between 1 and 2 on the number line into 10 equal parts and take 7 parts which represents $1.7 = 1 + 0.7$
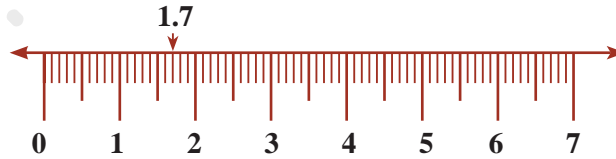
  (ii)   0.3

     We know that 0.3 is more than 0, but less than 1.

     There are 3 tenths in it. Divide the unit lenght between 0 and 1 on the number line into 10 equal parts and take 3 parts, which represent 0.3.

(iii) 2.1

We knowthat 2.1 is more than 2 and less than 3.

There are 2 ones and 1 tenths in it.

Divide the unit length between 2 and 3 into 10 equal parts and take 1 part, which represemt 2.1 = 2 + 0.1
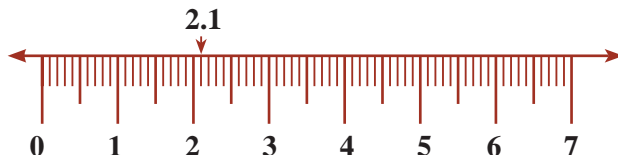
3. **Between which two whole numbers, the following decimal numbers lie?**

(i) 3.3   **(ii) 2.5**   **(iii) 0.9**

Sol : **(i)** 3.3

3.3 lies between 3 and 4.

(ii) 2.5

2.5 lies between 2 and 3.

(iii) 0.9

0.9 lies between 0 and 1.

4. **Find the greater decimal number in the following.**

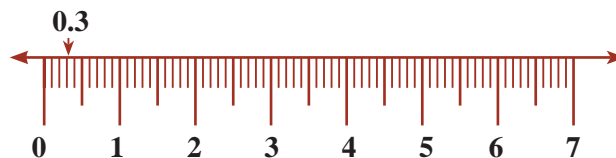**(i) 2.3, 3.2**   **(ii) 5.6, 6.5**   **(iii) 1.2, 2.1**

Sol : **(i)** 2.3, 3.2

Comparing the whole number parts of 2.3 and 3.2 we get 3 > 2.

3.2 > 2.3

Greater number is 3.2

(ii) 5.6, 6.5

Comparing the whole number parts of 5.6 and 6.5, we get 6 > 5.

6.5 > 5.6

Greater number is 6.5

(iii) 1.2, 2.1

Comparing the whole number parts of 1.2 and 2.1, we get 2 > 1.

2.1 > 1.2

Greater number is 2.1

5. **Find the smaller decimal number in the following.**

(i) 25.3, 25.03   **(ii) 7.01, 7.3**   **(iii) 5.6, 6.05**

Sol : **(i)** 25.3, 25.03

The whole number parts of both the numbers are equal.

∴ Comparing the digits at tenths place we get 0 < 3.

∴ 25.03 < 25.3

Smaller number 25.03

Term II

(ii) 7.01, 7.3

The whole number parts of both the numbers are equal.

Comparing the digits at tenths place we get $0 < 3$.

∴ $7.01 < 7.3$

Smaller number is 7.01.

(iii) 5.6, 6.05

Comparing the whole number parts, we get $5 < 6$.

∴ $5.6 < 6.05$

Smaller number is 5.6

OBJECTIVE TYPE QUESTIONS

6. **Between which two whole numbers 1.7 lie?**

(i) 2 and 3   (ii) 3 and 4   (iii) 1 and 2   **[Ans: (iii) 1 and 2]**

7. **The decimal number which lies between 4 and 5 is _____**

(i) 4.5   (ii) 2.9   (iii) 1.9   **[Ans: (i) 4.5]**

ADDITIONAL QUESTIONS

1. **Show that the following numbers in a number line.**

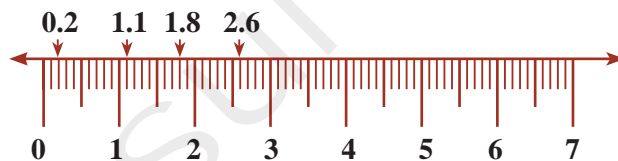**(i) 0.2**   **(ii) 1.8**   **(iii) 1.1**   **(iv) 2.6**

Sol :

2. **Write the decimal numbers represented by the points A, B, C, D, E and F.**

Sol :
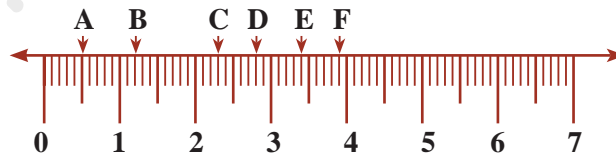
A (0.5)

B (1.2)

C (2.3)

D (2.8)

E (3.4)

F (3.9)

EXERCISE 1.5

Miscellaneous Practice problems

1. **Write the following decimal numbers in the place value table.**

(i) **247.36** (ii) **132.105**

Sol :

(i)

247.36	Hundreds	Tens	Ones	Tenths	Hundredths
	2	4	7	3	6

(ii)

132.105	Hundreds	Tens	Ones	Tenths	Hundredths	Thousandths
	1	3	2	1	0	5

2. **Write each of the following as decimal number.**

(i) $300 + 5 + \dfrac{7}{10} + \dfrac{9}{100} + \dfrac{2}{100}$ (ii) $1000 + 400 + 30 + 2 + \dfrac{6}{10} + \dfrac{7}{100}$

Sol :

(i) $300 + 5 + \dfrac{7}{10} + \dfrac{9}{100} + \dfrac{2}{100} = 305.792$

(ii) $1000 + 400 + 30 + 2 + \dfrac{6}{10} + \dfrac{7}{100} = 1432.67$

3. **Which is greater?**

(i) **0.888 (or) 0.28** (ii) **23.914 (or) 23.915**

Sol : (i) 0.888 (or) 0.28

The whole number parts is equal for both the numbers.

Comparing the digits in the tenths place we get, $8 > 2$.

∴ $0.888 > 0.28$

0.888 is greater.

(ii) 23.914 or 23.915

The whole number part is equal in both the numbers.

Also the tenth place and hundredths place are also equal.

∴ Comparing the thousandths place, we get $5 > 4$.

$23.915 > 23.914$

∴ 23.915 is greater.

Term II

4. **In a 25 m swimming competition, the time taken by 5 swimmers A, B, C, D and E are 15.7 seconds, 15.68 seconds, 15.6 seconds, 15.74 seconds and 15.67 seconds respectively. Identify the winner.**

Sol : The winner is one who took less time for swimming 25 m.

Comparing the time taken by A, B, C, D, E the whole number part is equal for all participants.

Comparing digit in tenths place we get $6 < 7$.

∴ Comparing 15.68, 15.6, 15.67, that is comparing the digits in hundredths place we get $15.60 < 15.67 < 15.68$

One who took 15.6 seconds is the winner.

∴ C is the winner.

5. **Convert the following decimal numbers into fractions.**

   (i)   23.4   **(ii)   46.301**

Sol : (i) $23.4 = \dfrac{234}{10} = \dfrac{234 \div 2}{10 \div 2} = \dfrac{117}{5}$

   (ii) $46.301 = \dfrac{46301}{1000}$

6. **Express the following in kilometres using decimals.**

   (i)   256 m   **(ii)   4567 m**

Sol :   1 m $= \dfrac{1}{1000}$ km $= 0.001$ km

   (i)   256 m $= \dfrac{256}{1000}$ km $= 0.256$ km

   (ii)   4567 m $= \dfrac{4567}{1000}$ km $= 4.567$ km

7. **There are 26 boys and 24 girls in a class. Express the fractions of boys and girls as decimal numbers.**

Sol : Boys $= 26$

Girls $= 24$

Total $= 50$

Fraction of boys $= \dfrac{26}{50} = \dfrac{26 \times 2}{50 \times 2} = \dfrac{52}{100} = 0.52$

Fraction of girls $= \dfrac{24}{50} = \dfrac{24 \times 2}{50 \times 2} = \dfrac{48}{100} = 0.48$

Challenge Problems

8. **Write the following amount using decimals.**

    (i) **809 rupees 99 paise**   **(ii)** **147 rupees 70 paise**

Sol :

$$100 \text{ paise} = 1 \text{ rupee}$$

$$1 \text{ paise} = \frac{1}{100} \text{ rupee}$$

  (i) $809 \text{ rupees } 99 \text{ paise} = 809 \text{ rupees} + \dfrac{99}{100} \text{ rupees}$

$$= 809 + 0.99 \text{ rupees}$$

$$= ₹ \ 809.99$$

  (ii) $147 \text{ rupees } 70 \text{ paise} = 147 \text{ rupees} + \dfrac{70}{100} \text{ rupees}$

$$= 147 \text{ rupees} + 0.70 \text{ rupees}$$

$$= ₹ \ 147.70$$

9. **Express the following in metres using decimals.**

    (i) **1328 cm**   **(ii)** **419 cm**

Sol : $100 \text{ cm} = 1 \text{ m}$

$$1 \text{ cm} = \frac{1}{100} \text{ m}$$

  (i) $1328 \text{ cm} = \dfrac{1328}{100} \text{ m} = 13.28 \text{ m}$

  (ii) $419 \text{ cm} = \dfrac{419}{100} \text{ m} = 4.19 \text{ m}$

10. **Express the following using decimal notation.**

    (i) **8 m 30 cm in metres**

    (ii) **24 km 200 m in kilometres**

Sol : **(i)** 8 m 30 cm in metres

$$8 \text{ m} + \frac{30}{100} \text{ m} = 8 \text{ m} + 0.30 \text{ m} = 8.30 \text{ m}$$

  (ii) 24 km 200 m in kilometres

$$24 \text{ km} + \frac{200}{1000} \text{ km} = 24 \text{ km} + 0.200 \text{ km} = 24.200 \text{ km}$$

11. **Write the following fractions as decimal numbers.**

    (i) $\dfrac{23}{10000}$ **(ii)** $\dfrac{421}{100}$ **(iii)** $\dfrac{37}{10}$

Term II

Sol : (i) $\dfrac{23}{10000} = 0.0023$

(ii) $\dfrac{421}{100} = 4.21$

(iii) $\dfrac{37}{10} = 3.7$

12. Convert the following decimals into fractions and reduce them to the lowest form.

(i) **2.125** (ii) **0.0005**

Sol : (i) $2.125 = \dfrac{2125}{1000} = \dfrac{2125 \div 25}{1000 \div 25} = \dfrac{85}{40} = \dfrac{85 \div 5}{40 \div 5} = \dfrac{17}{8}$

(ii) $0.0005 = \dfrac{5}{10000} = \dfrac{5 \div 5}{10000 \div 5} = \dfrac{1}{2000}$

13. Represent the decimal numbers 0.07 and 0.7 on a number line.

Sol :
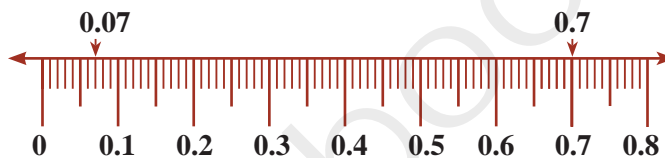
0.07 lies between 0.0 and 0.1

The unit space between 0 and 0.1 is divided into 10 equal parts and 7th part is taken.

Also 0.7 lies between 0 and 1.

The unit space between 0 and 1 is divided into 10 equal parts, and the 7th part is taken.

14. Write the following decimal numbers in words.

(i) **4.9** (ii) **220.0** (iii) **0.7** (iv) **86.3**

Sol : (i) 4.9 = Four and nine tenths

(ii) 220.0 = Two hundred and twenty

(iii) 0.7 = Seven tenths

(iv) 86.3 = Eighty six and three tenths.

15. Between which two whole numbers the given numbers lie?

(i) **0.2** (ii) **3.4** (iii) **3.9** (iv) **2.7**

(v) **1.7** (vi) **1.3**

Sol : (i) 0.2 lies between 0 and 1.

(ii) 3.4 lies between 3 and 4.

(iii) 3.9 lies between 3 and 4.

(iv) 2.7 lies between 2 and 3.

(v) 1.7 lies between 1 and 2.

(vi) 1.3 lies between 1 and 2.

16. By how much is $\dfrac{9}{10}$ km less than 1 km. Express the same in decimal form.

Sol : Given measures are 1 km and $\dfrac{9}{10}$ km.

i.e., 1 km and 0.9 km.

Difference = 1.0 – 0.9 = 0.1 km.

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UNIT TEXT

Time: 1 hrs   **Max Marks : 25**

I. **Choose the best answer from the options given below.**   **5 × 1 = 5**

1. **Lowest form of decimal 0.005 is**

  (i) $\dfrac{3}{1000}$ (ii) $\dfrac{1}{200}$ (iii) $\dfrac{2}{200}$ (iv) $\dfrac{5}{100}$

2. **Which of the following decimals is the smallest?**

  (i) 0.37   (ii) 1.52   (iii) 0.087   (iv) 0.105

3. **The decimal 0.238 is equal to**

  (i) $\dfrac{119}{500}$ (ii) $\dfrac{238}{25}$ (iii) $\dfrac{119}{25}$ (iv) $\dfrac{119}{50}$

4. **0.7499 lies between**

  (i) 0.7 and 0.74   (ii) 0.75 and 0.79

  (iii) 0.749 and 0.75   (iv) 0.74992 and 0.75

5. **0.023 lies between**

  (i) 0.2 and 0.3   (ii) 0.02 and 0.03

  (iii) 0.03 and 0.029   (iv) 0.026 and 0.024

II. **Answer the following questions.**   **5 × 2 = 10**

6. Write three hundred five and four hundredth as decimal form.

7. Write 3.4 as fraction in lowest form.

8. Write $300 + 40 + 5 + \dfrac{2}{100}$ as decimals.

9. Which is greater 1 or 0.99?

10. Convert 5244 g to kg.

Term II

III. Answer the following questions. $2 \times 5 = 10$

11. Arrange 12.143, 12.125, 12.105, 12.402 and 12.214 in ascending order.

12. Which one is greater 1 m 40 cm + 60 cm or 2.6 m?

ANSWERS

I. **1.** (ii) $\dfrac{1}{200}$ **2.** (iii) 0.087

3. (i) $\dfrac{119}{500}$ **4.** (iii) 0.749 and 0.75

5. (ii) 0.02 and 0.03

II. **6.** 305.04   **7.** $\dfrac{17}{5}$

8. 345.02   **9.** 1

10. 5.244 kg

III. **11.** 12.105, 12.125, 12.143, 12.214, 12.402

12. 2.6 m

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TERM

III

CONTENTS

NUMBER SYSTEM

Representing a Decimal Number

✦ To round a decimal

✦ First underline the digit that is to be rounded. Then look at the digit to the right of the underlined digit.

✦ If that digit is less than 5, then the underlined digit remains the same.

✦ If that digit is greater than or equal to 5, add 1 to the underlined digit.

✦ After rounding of leave all the digits after the underlined digit.

TRY THESE

(Text book Page No. 1)

1. Represent the fraction $\dfrac{1}{4}$ in decimal form.

Sol. $\dfrac{1}{4} = \dfrac{1 \times 25}{4 \times 25} = \dfrac{25}{100} = 0.25$

2. What is the place value of 5 in 63.2$\underline{5}$7.

Sol. Place value of 5 in 63.257 is 5 hundredths (Hundreth place)

3. Identify the digit in the tenth place of 75.036.

Sol. 0

4. Express the decimal number 3.75 as a fraction.

Sol. $3.75 = \dfrac{375}{100} = \dfrac{15}{4}$

5. Write the decimal number for the fraction $5\dfrac{1}{5}$.

Sol. $5\dfrac{1}{5} = \dfrac{26}{5} = \dfrac{26 \times 2}{5 \times 2} = \dfrac{52}{10} = 5.2$

6. Identify the biggest number : 0.567 and 0.576.

Sol. Comparing the digits of 0.567 and 0.576 from left to right, we have the tenths place same comparing the hundredths place $7 > 6$.

$\Rightarrow 0.576 > 0.567$

7. Compare 3.30 and 3.03 and identify the smaller number.

Sol. The whole number is equal in both the numbers.

Now comparing the tenths place we have $3 > 0$

$\Rightarrow 3.03 < 3.30$ Smaller number is 3.03

8. Put the appropriate sign (<, >, =). 2.57 ☐ 2.570

Sol. 2.57 $\boxed{=}$ 2.570

9. **Arrange the following decimal numbers in ascending order.**
5.14, 5.41, 1.54, 1.45, 4.15, 4.51.

Sol. Comparing the numbers from left to right.

Ascending order : 1.45, 1.54. 4.15, 4.51, 5.14, 5.41

EXERCISE 1.1

1. **Round each of the following decimals to the nearest whole number.**

(i)	**8.71**	**(ii)**	**26.01**	**(iii)** 69.48		**(iv)**	**103.72**
(v)	**49.84**	**(vi)**	**101.35**	**(vii)** 39.814		**(viii)** 1.23	

Sol. **(i)** 8.71

Underlining the digit to be rounded <u>8</u>.71. Since the digit next to the underlined digit, 7 which is greater than 5, adding 1 to the underlined digit. Hence the nearest whole number 8.71 rounds to is <u>9</u>.

(ii) 26.01

Underlining the digit to be rounded 2<u>6</u>.01. Since the digit next to the underlined digit, 0 which is less than 5, the underlined digit 6 remains the same.

∴ The nearest whole number 26.01 rounds to is 26.

(iii) 69.48

Underlining the digit to be rounded 69<u>.</u>48. Since the digit next to the underlined digit, 4 which is less than 5, the underlined digit 9 remains the same.

∴ The whole number is 69.48 rounds to is 69.

(iv) 103.72

Underlining the digit to be rounded 10<u>3</u>.72 since the digit next to the underlined digit, 7 which is greater than 5, we add 1 to the under lined digit.

Hence the nearest whole number 103.72 rounds to is 104.

(v) 49.84

Underlining the digit to be rounded 4<u>9</u>.84. Since the digit next to the underlined digit 8 which is greater than 5, we add 1 to the underlined digit.

Hence the nearest whole number 49.84 rounds to 50.

(vi) 101.35

Underlining the digit to be rounded 10<u>1</u>.35. Since the digit next to the underlined digit 3 is less than 5, the underlined digit 1 remains the same.

Hence the nearest whole number 101.35 rounds to is 101.

(vii) 39.814

Underlining the digit to be rounded 3<u>9</u>.814. Since the digit next to the underlined digit 8 is greater than 5, we add 1 to the underlined digit.

Hence the nearest whole number 39.814 rounds to is 40.

(viii) 1.23

Underlining the digit to be rounded <u>1</u>.23. Since the digit next to the underlined digit 2, is less than 5, the underlined digit 1 remains the same.

Hence the nearest whole number 1.23 rounds to is 1.

2. Round each decimal number to the given place value.

   (i) 5.992; tenths place

   (ii) 21.805; hundredth place

   (iii) 35.0014; thousandth place

Sol. **(i)**   992; tenths place

       Underlining the digit to be rounded 5.992. Since the digit next to the underlined digit is 9 greater than 5, we add 1 to the underlined digit.

       Hence the rounded number is 6.0.

   (ii) 21.805; hundredth place

       Underlining the digit to be rounded 21.805 since the digit next to the underlined digit is 5, we add 1 to the underlined digit.

       Hence the rounded number is 21.81.

   (iii) 35.0014; thousandth place

       Underlining the digit to be rounded 35.0014. Since the digit next to the underlined digit is 4 less than 5 the underlined digit remains the same.

       Hence the rounded number is 35.001.

3. Round the following decimal numbers upto 1 places of decimal.

   (i)   123.37   **(ii)   19.99**   **(iii) 910.546**

Sol. **(i)**   123.37

       Rounding 123.37 upto one places of decimal means round to the nearest tenths place. Underling the digit in the tenths place of 123.37 gives 123.37.

       Since the digit next to the tenth place value is 7 which is greater than 5, we add 1 to the underlined digit to get 123.4.

       Hence the rounded value of 123.37 upto one places of decimal is 123.4.

   (ii) 19.99

       Rounding 19.99 upto one places of decimal means round to the nearest tenth place. Underling the digit in the tenths place of 19.99 gives 19.99.

       Since the digit next to the tenth place value is 9 which is greater than 5, we add 1 to the underlined digit to get 20.

       Hence the rounded value of 19.99 upto one places of decimal is 20.0.

   (iii) 910.546

       Rounding 910.546 upto one places of decimal means round to the nearest tenths place underlining the digit in the tenths place of 910.546 gives 910.546.

       Since the digit next to the tenth place value is 4, which is less than 5 the underlined digit remains the same.

       Hence the rounded value of 910.546 upto one places of decimal is 910.5.

Term III

4. Round the following decimal numbers upto 2 places of decimal.

(i) 87.755   (ii) 301.513   (iii) 79.997

Sol. **(i)** 87.755

Rounding 87.755 upto 2 places of decimal means round to the nearest hundredths place. Underlining the digit in the hundredth place of 87.755 gives 87.7<u>5</u>5. Since the digit next to the hundredth place value is 5, we add 1 to the underlined digit.

Hence the rounded value of 87.755 upto two places of decimal is 87.76.

(ii) 301.513

Rounding 301.51 upto 2 places of decimal means round to the nearest hundredths place. Underlining the digit in the hundredth place of 301.513 gives 301.5<u>1</u>3. Since the digit next to the underlined digit 3 is less than 5, the underlined digit remains the same.

∴ The rounded value of 301.513 upto 2 places of decimal is 301.51.

(iii) 79.997

Rounding 79.997 upto 2 places of decimal means round to the nearest hundredths place. Underlining the digit in the hundredth place of 79.997 gives 79.9<u>9</u>7. Since the digit next to the underlined digit 7 is greater than 5, we add 1 to the underlined number.

Hence the rounded value of 79.997 upto 2 places of decimal is 80.00.

5. Round the following decimal numbers upto 3 place of decimal

(a) 24.4003   (b) 1251.2345   (c) 61.00203

Sol. **(a)** 24.4003

Rounding 24.4003 upto 3 places of decimal means rounding to the nearest thousandths place. Underlining the digit in the thousandths place of 24.4003 gives 24.40<u>0</u>3. In 24.40<u>0</u>3 the digit next to the thousandths value is 3 which is less than 5.

∴ The underlined digit remains the same. So the rounded value of 24.4003 upto 3 places of decimal is 24.400.

(b) 1251.2345

Rounding 1251.2345 upto 3 places of decimal means rounding to the nearest thousandths place. Underlining the digit in the thousandths place of 1251.2345 gives 1251.23<u>4</u>5, the digit next to the thousandths place value is 5 and so we add 1 to the underlined digit. So the rounded value of 1251.2345 upto 3 places of decimal is 1251.235.

(c) 61.00203

Rounding 61.00203 upto 3 places of decimal means rounding to the nearest thousandths place. Underlining the digit in the thousandth place of 61.00203 gives 61.00<u>2</u>03. In 61.00<u>2</u>03, the digit next to the thousandths place value is 0, which is less than 5.

Hence the underlined digit remains the same. So the rounded value of 61.00203 upto 3 places of decimal is 61.002.

ADDITIONAL QUESTIONS

1. **Match the following:**

1.	39.814 ≈ 39.8	(i)	Rounded to hundredth place
2.	35.0014 ≈ 35.001	(ii)	Rounded to ten thousandth place
3.	21.805 ≃ 21.81	(iii)	Rounded to nearest whole number
4.	8.71 ≈ 9	(iv)	Rounded to thousandth place
5.	61.00208 ≈ 61.00221	(v)	Rounded to tenth place

[Ans : 1-(v); 2-(iv); 3-(i); 4-(iii); 5-(ii)]

2. **Round 89.357 to the nearest whole number.**

Sol. Underlining the digit to be rounded 8$\underline{9}$.357. Since the digit next to the underlined digit 3 which is less than 5, the underlined digit remains the same.

∴ The nearest whole number 89.357 rounds to 89.

3. **Round 110.929 to the nearest tenths place.**

Sol. Underlining the digit to be rounded 110.$\underline{9}$29. Since the digit next to the underlined digit is 2 which is less than 5.

∴ The underlined digit 9 remains the same. Hence the rounded number is 110.9

4. **Round 87.777 upto 2 places of decimal.**

Sol. Rounding 87.777 upto 2 places of decimal means round to the nearest hundredths place. Underlining the digit in the hundredth place of 87.777 gives 87.7$\underline{7}$7. Since the digit after the hundredth place value is 7 which is more than 5, we add 1 to the underlined digit. So the rounded value of 87.777 upto 2 places of decimal is 87.78

Operations on Decimal Numbers

✦ Adding zeros at the right end of decimal digits will not change the value of the number.

✦ Zeros are added at the right end of decimal digits of a decimal number that are to be added or subtracted.
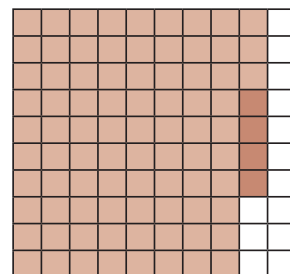
🙌 TRY THESE

(Text book Page No. 6)

i. **Find the following using grid models:**

(i) **0.83 + 0.04**   **(ii)** **0.35 – 0.09**

Sol. **(i)**   0.83 + 0.04

$0.83 = \dfrac{83}{100}$ and $0.04 = \dfrac{4}{100}$

Term III

Shading the regions

0.83 and 0.04

The sum is the total shaded region.

S = 0.83 + 0.04 = 0.87

(ii) 0.35 – 0.09

$0.35 = \dfrac{35}{100}$ and $0.09 = \dfrac{9}{100}$

Shading the regions 0.35 by shading 35 boxes out of 100.

Striking off 9 boxes out of 35 shaded boxes to subtract 0.09 from 0.35.

The left over shaded boxes represent the required value.

∴ 0.35 – 0.09 = 0.26
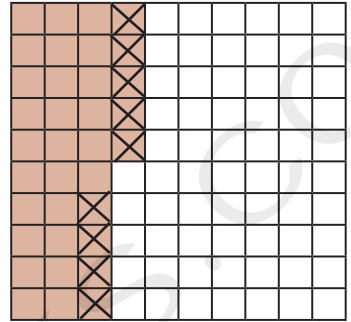
TRY THESE

Using the area models solve the following

(i) **1.2+3.5**

(ii) **3.5 − 2.3**

Sol. **(i)**

1.2
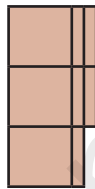
3.5
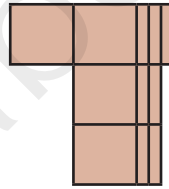
4.7

Here 1.2 is represented in blue colour and 3.5 is represented in Green colour. Sum of 1.2 and 3.5 is 4.7.

(ii) 3.5 − 2.3

Representing 3.5 using 3 squares and 5 rectangular strips. Crossing out 2squares from 3 squares and 3 rectangular strips from 5 to get the difference.

So 3.5 – 2.3 = 1.2.

TRY THESE

Complete the magic square in such a way that rows, columns and diagonals give the same sum 1.5.

0.8		0.6
	0.5	
0.4		

Sol.

0.8	0.1	0.6
0.3	0.5	0.7
0.4	0.9	0.2

⌇ Sura's ⟹ **7th Std - Mathematics**

EXERCISE 1.2

1. **Add by using grid 0.51+0.25.**

Sol. Here $0.51 = \dfrac{51}{100}$ and $0.25 = \dfrac{25}{100}$

First we shade the region 0.51 and then 0.25.

The sum is the total shaded area.

$0.51 + 0.25 = 0.76$
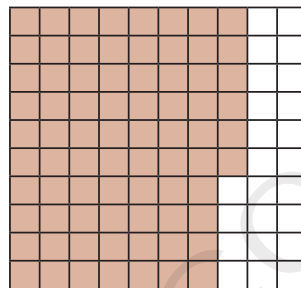
2. **Add the following by using place value grid.**
(i) **25.8 + 18.53** **(ii) 17.4 + 23.435**

Sol. **(i)** 25.8 + 18.53

Using place value grid.

Decimal No	Tens	Ones	Tenths	Hundredths
25.8	2	5	8	0
18.53	1	8	5	3
44.33	4	4	3	3

Therefore 25.8 + 18.53 = 44.33

(ii) 17.4 + 23.435

Lets use the place value grid.

Decimal No	Tens	Ones	Tenths	Hundredths	Thousandths
17.4	1	7	4	0	0
23.435	2	3	4	3	5
40.835	4	0	8	3	5

Therefore 17.4 + 23.435 = 40.835

3. **Find the value of 0.46 − 0.13 by grid model.**

Sol. Here $0.46 = \dfrac{46}{100}$ and $0.13 = \dfrac{13}{100}$

Shading the region 0.46 and then crossing out 0.13 from the shaded area.

The left out shaded region without cross marks is the difference.

So 0.46 – 0.13 = 0.33

Term III

301

Chapter -1 - Number System

4. Subtract the following by using place value grid.
(i) 6.567 from 9.231   (ii) 3.235 from 7

Sol. (i) Let as use place value grid

Decimal No	Ones	Tenths	Hundredths	Thousandths
9.231	9	2	3	1
6.567	6	5	6	7
2.664	2	6	6	4

Therefore 9.231 – 6.567 = 2.664

(ii) Let as use place value grid.
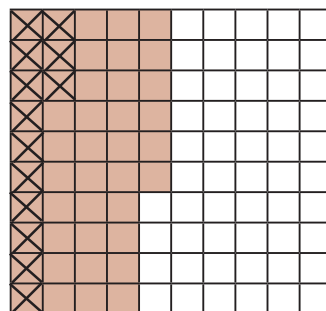
Decimal No	Ones	Tenths	Hundredths	Thousandths
7.000	7	0	0	0
3.235	3	2	3	5
3.765	3	7	6	5

Therefore 7 – 3.235 = 3.765

5. Simplify: 23.5−27.89 + 35.4 − 17.

Sol. 23.5– 27.89 + 35.4 – 17 = 14.01

	23.50
(+)	35.40
	58.90
(–)	27.89
	31.01
(–)	17.00
	14.01

6. Sulaiman bought 3.350 kg of Potato, 2.250 kg of Tomato and some onions. If the weight of the total items are 10.250 kg, then find the weight of onions?

Sol.

$$\begin{aligned}
\text{Weight of Potato} &= 3.350 \text{ kg} \\
\text{Weight of Tomato} &= 2.250 \text{ kg} \\
\text{Total weight of Potato and Tomato} &= (3.350 + 2.250 \text{ kg}) = 5.600 \text{ kg} \\
\text{Weight of potato, tomato and onions} &= 10.250 \\
\text{Weight of potato and tomato} &= 5.600 \\
\therefore \quad \text{Weight of onions} &= (10.250 - 5.600) \text{ kg} \\
&= 4.650 \text{ kg} \\
\text{Weight of onions} &= 4.650 \text{ kg}
\end{aligned}$$

7. What should be subtracted from 7.1 to get 0.713?

Sol. To get the number to be subtracted

We have 7.1 – 0.713 = 6.387

∴ The number to be subtracted

= 6.387

	7.100
(–)	0.713
	6.387

8. How much is 35.6 km less than 53.7 km?

	53.7
(−)	35.6
	18.1

Sol. To get the answer we must subtract 53.7km – 35.6 km = 18.1 km

So 35.6 km is 18.1 km less than 53.7 km.

9. Akilan purchased a geometry box for ₹ 25.75, a pencil for ₹ 3.75 and a pen for ₹ 17.90. He gave ₹ 50 to the shopkeeper. What amount did he get back?

Sol.

Cost of geometry box	=	₹ 25.75 (+)
Cost of Pencil box	=	₹ 3.75
Cost of a pen	=	₹ 17.90
Amount to be paid	=	₹ 47.40
Amount paid	=	₹ 50.00 (−)
Amount to be paid	=	₹ 47.40
Amount to get back	=	₹ 2.60
∴ Amount to get back	=	₹ 2.60

10. Find the perimeter of an equilateral triangle with a side measuring 3.8 cm.

Sol. Perimeter of an equilateral triangle = (Side + Side + Side) Sq. units.

Given side = 3.8	
∴ Perimeter = 3.8 + 3.8 + 3.8	
Perimeter of the triangle = 11.4 cm	

	3.8
(+)	3.8
(+)	3.8
	11.4

OBJECTIVE TYPE QUESTIONS

11. 1.0 + 0.83 =?

  (i) 0.17   (ii) 0.71

  (iii) 1.83   (iv) 1.38

[Ans : (iii) 1.83]

Hint :

	1.0
(+)	0.83
	1.83

12. 7.0 – 2.83 = ?

  (i) 3.47   (ii) 4.17

  (iii) 7.34   (iv) 4.73

[Ans : (ii) 4.17]

Hint :

	6 9 10
	7.00
(−)	2.83
	4.17

13. Subtract 1.35 from 3.51

  (i) 6.21   (ii) 4.86

  (iii) 8.64   (iv)   2.16

[Ans : (iv) 2.16]

Hint :

	4 11
	3.51
(−)	1.35
	2.16

Term III

14. Sum of two decimals is 4.78 and one decimal is 3.21 then the other one is

(i) 1.57   (ii) 1.75
(iii) 1.59   (iv) 1.58

Hint :

$$
\begin{array}{r}
4.78 \\
(-) \quad 3.21 \\
\hline
\mathbf{1.57} \\
\hline
\end{array}
$$

[Ans : (i) 1.57]

15. The difference of two decimals is 86.58 and one of the decimal is 42.31 Find the other one

(i) 128.89   (ii) 128.69
(iii) 128.36   (iv) 128.39

[Ans : (i) 128.89]

Hint :

$$
\begin{array}{r}
86.58 \\
(+) \quad 42.31 \\
\hline
\mathbf{128.89} \\
\hline
\end{array}
$$

ADDITIONAL QUESTIONS

1. If Sheela bought 2.083 kg of grapes and 3.752 kg of orange. What is the total weight of fruits.

Sol.

Weight of grapes	=	2.083 kg
Weight of orange	=	2.752 kg
Total weight	=	(2.083 + 2.752) kg
	=	4.835 kg

	2.083
(+)	2.752
	4.835

2. Kathir bought 8.72 kg of sugar, 7.302 kg of grains. His carry bag can contain only 15kg of weight. What is the remaining weight of items bought?

Sol.

Weight of sugar	=	8.72 kg (+)
Weight of grains	=	7.302 kg
Total weight	=	16.022 kg (−)
Capacity of carry bag	=	15.000 kg
Remaining weight	=	1.002 kg
Remaining weight	=	1.002 kg

3. Use place value grid to add 7.357 and 13.92.

Sol. Let as use place value grid.

Decimal No	Tens	Ones	Tenths	Hundredths	Thousandths
7.357	0	7	3	5	7
13.92	1	3	9	2	0
21.277	2	1	2	7	7

Multiplication of Decimal Numbers

✦ The number of decimal digits in the product of two decimal numbers is equal to the sum of decimal digits of decimal digits that are multiplied.

✦ When a decimal number is multiplied by 10, 100 or 1000, the digits in the product are same as in the decimal number but the decimal point in the product is shifted to the right by as many places as there are zeros followed by 1.

Think

How are the products 2.1×3.2 and 21×32 alike? How are they different.

Sol. $2.1 \times 3.2 = 6.72$ and $21 \times 32 = 672$

In both the cases the digits ambers are the same. But the place value differs.

TRY THESE

(1) **Shade the grid to multiply 0.3×0.6.**
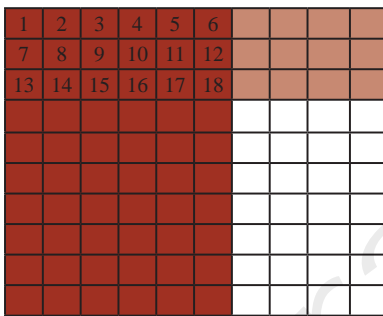
3 rows of Yellow represent 0.3, 6 columns of Red colour represent 0.6 Double shaded 18 squares of orange colour represent.

∴ $0.30 \times 0.6 = 0.18$

(2) **Use the area model to multiply**

$$1.2 \times 2.5$$

Here each row contains 1 whole and 2 tenths. Each column contains 2 wholes and 5 tenths.

The entire area model represents 2 wholes 9 tenths and 10 hundredths (= 1 tenths)

So $1.2 \times 2.5 = 3$.

👐 TRY THESE

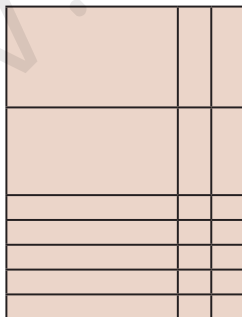|		
$2.35 \times 10 = \dfrac{235}{100} \times 10$ $= \dfrac{235}{10} = 23.5$	$7.63 \times 10 = \underline{\textbf{76.3}}$	$63.237 \times 10 = \underline{\textbf{632.37}}$
$2.35 \times 100 = \dfrac{235}{100} \times 100$ $= 235 = 235.0$	$7.63 \times 100 = \underline{\textbf{763}}$	$63.237 \times 100 = \underline{\textbf{6323.7}}$
$2.35 \times 1000 = \dfrac{235}{100} \times 1000$ $= 2350.0$	$7.63 \times 1000 = \underline{\textbf{7630}}$	$63.237 \times 1000 = \underline{\textbf{63237}}$
$0.6 \times 10 = \dfrac{6}{10} \times 10$ $= 6$	$0.6 \times 100 = \dfrac{6}{10} \times 100$ $= \underline{\textbf{60}}$	$0.6 \times 1000 = \dfrac{6}{10} \times 1000$ $= \underline{\textbf{600}}$

👐 TRY THESE

Find: **(i) 9.13×10** **(ii) 9.13×100** **(iii) 9.13×1000**

Sol. **(i)** 9.13×10 $= 91.3$

(ii) 9.13×100 $= 913$

(iii) 9.13×1000 $= 9130$

👐 TRY THESE

11.6×0.1	$\dfrac{116}{10} \times \dfrac{1}{10}$	$\dfrac{116}{100}$	1.16
11.6×0.01	$\dfrac{116}{10} \times \dfrac{1}{100}$	$\dfrac{116}{1000}$	0.116
11.6×0.001	$\dfrac{116}{10} \times \dfrac{1}{1000}$	$\dfrac{116}{10000}$	0.0116

EXERCISE 1.3

1. **Find the product of the following**

(i) **0.5 × 3**   (ii) **3.75 × 6**   (iii) **50.2 × 4**

(iv) **0.03 × 9**   (v) **453.03 × 7**   (vi) **4 × 0.7**

Sol. (i) 0.5×3

$$5 \times 3 = 15$$
$$\therefore \ 0.5 \times 3 = 1.5$$

(ii) 3.75×6

$$375 \times 6 = 2250$$
$$3.75 \times 6 = 22.50$$

3.75	2 decimal places
× 6	
22.50	2 decimal places

(iii) 50.2×4

$$502 \times 4 = 2008$$
$$50.2 \times 4 = 200.8$$

50.2	1 decimal place
× 4	
200.8	1 decimal place

(vi) 0.03×9

$$3 \times 9 = 27$$
$$0.03 \times 9 = 0.27$$

(v) 453.03×7

$$45303 \times 7 = 317121$$
$$453.03 \times 7 = 3171.21$$

453.03	2 decimal places
× 7	
3171.21	2 decimal places

(vi) 4×0.7

$$4 \times 7 = 28$$
$$4 \times 0.7 = 2.8$$

2. **Find the area of the parallelogram whose base is 6.8 cm and height is 3.5 cm.**

Sol. Base of the parallelogram b = 6.8 cm

Height of the parallelogram h = 3.5 cm

Area of the parallelogram A = $b \times h$ sq.units

$$= 6.8 \times 3.5 \text{ cm}^2$$

Area of the parallelogram = 23.80 cm²

6.8	1 decimal place
× 3.5	1 decimal place
340	
2040	
23.80	2 decimal places

3. **Find the area of the rectangle whose length is 23.7 cm and breadth is 15.2 cm.**

Sol. Length of the rectangle l = 23.7 cm

Breadth of the rectangle b = 15.2 cm

Area of the rectangle A = $l \times b$ sq.units

$$= 23.7 \times 15.2 \text{ cm}^2$$

Area of the rectangle = 360.24 cm²

23.7	1 decimal place
× 15.2	1 decimal place
474	
11850	
12700	
360.24	2 decimal places

Term III

4. Multiply the following

(i) **2.57 × 10** (ii) **0.51 × 10** (iii) **125.367 × 100** (iv) **34.51 × 100**
(v) **62.735 × 100** (vi) **0.7 × 10** (vii) **0.03 × 100** (viii) **0.4 × 1000**

Sol. (i) $2.57 \times 10 = 25.7$

(ii) $0.51 \times 10 = 5.1$

(iii) $125.367 \times 100 = 12536.7$

(iv) $34.51 \times 100 = 3451$

(v) $62.735 \times 100 = 6273.5$

(vi) $0.7 \times 10 = 7.0$

(vii) $0.03 \times 100 = 3$

(viii) $0.4 \times 1000 = 400$

5. A wheel of a baby cycle covers 49.7 cm in one rotation. Find the distance covered in 10 rotations.

Sol. Length covered in 1 rotation = 49.7 cm
Length covered in 10 rotations = 49.7×10 cm
= 497 cm

6. A picture chart costs ₹ 1.50. Radha wants to buy 20 charts to make an album. How much does she have to pay?

Sol. Cost of 1 chart = ₹ 1.50
Cost of 20 charts = ₹ 1.50×20
= ₹ 30.00
Cost of 20 charts = ₹ 30

```
 1.50
× 20
30.00
```

7. Find the product of the following.

(i) **3.6 × 0.3** (ii) **52.3 × 0.1** (iii) **537.4 × 0.2**
(iv) **0.6 × 0.06** (v) **62.2 × 0.23** (vi) **1.02 × 0.05**
(vii) **10.05 × 1.05** (viii) **101.01 × 0.01** (ix) **100.01 × 1.1**

Sol. (i) 3.6×0.3
$36 \times 3 = 108$
$3.6 \times 0.3 = 1.08$

3.6	1 decimal place
×0.3	1 decimal place
1.08	2 decimal places

(ii) 52.3×0.1
$523 \times 1 = 523$
$52.3 \times 0.1 = 5.23$

(iii) 537.4×0.2
$5374 \times 2 = 10748$
$537.4 \times 0.2 = 107.48$

537.4	1 decimal place
× 0.2	1 decimal place
107.48	2 decimal places

(iv) 0.6×0.06

$$6 \times 6 = 36$$
$$0.6 \times 0.06 = 0.036$$

(v) 62.2×0.23

$$622 \times 23 = 14306$$
$$62.2 \times 0.23 = 14.306$$

```
  62.2    1 decimal place
× 0.23    2 decimal places
 ─────
  1866
12440
─────
14.306   3 decimal places
```

(vi) 1.02×0.05

$$102 \times 5 = 510$$
$$1.02 \times 0.05 = 0.0510$$

(vii) 10.05×1.05

$$1005 \times 105 = 105525$$
$$10.05 \times 1.05 = 10.5525$$

```
  10.05    2 decimal places
× 1.05     2 decimal places
 ─────
  5025
 00000
100500
──────
10.5525   4 decimal places
```

(viii) 101.01×0.01

$$10101 \times 1 = 10101$$
$$101.01 \times 0.01 = 1.0101$$

(ix) 100.01×1.1

$$10001 \times 11 = 110011$$
$$100.01 \times 1.1 = 110.011$$

OBJECTIVE TYPE QUESTIONS

8. 1.07×0.1 _____

(i) 1.070   (ii) 0.107   (iii) 10.70   (iv) 11.07 **[Ans : (ii) 0.107]**

Hint : $107 \times 1 = 107$
$$1.07 \times 0.1 = 0.107$$

9. $2.08 \times 10 =$ _____

(i) 20.8   (ii) 208.0   (iii) 0.208   (iv) 280.0   **[Ans : (i) 20.8]**

Hint : $208 \times 10 = 2080$
$$2.08 \times 10 = 20.80 = 20.8$$

10. **A frog jumps 5.3 cm in one jump. The distance travelled by the frog in 10 jumps is _____.**

(i) 0.53 cm   (ii) 530 cm   (iii) 53.0 cm   (iv) 53.5 cm

[Ans : (iii) 53.0 cm]

Hint : $53 \times 10 = 530$
$$5.3 \times 10 = 53.0$$

Term III

ADDITIONAL QUESTIONS

1. **Cost of 1m cloth is ₹ 6.75. Find the cost of 14.75m correct to two places of decimal.**

Sol.
Cost of 1 m cloth $\quad=$ ₹ 6.75

Cost of 14.75m cloth $\quad=$ 14.75×6.75

$\qquad\qquad\qquad\quad=$ ₹ 99.5625

$\qquad\qquad\qquad\quad=$ ₹ 99.56

14.75	2 decimal places
× 6.75	2 decimal places
7375	
103250	
885000	
99.5625	4 decimal places

2. **Length of a side of a square is 18.35 cm. Find its Area.**

Sol.
Side of a square $\quad=$ 18.35 cm

Area of a square $\quad=$ (Side × Side) sq.units

$\qquad\qquad\qquad\quad=$ 18.35×18.35 cm^2

$\qquad\qquad\qquad\quad=$ 336.7225 cm^2

18.35	2 decimal places
× 18.35	2 decimal places
9175	
55050	
1835000	
336.7225	4 decimal places

Division of Decimal Numbers

✦ When a decimal number is divided by 10, 100 and 1000, the digits of the number (Dividend) and the obtained decimal number after division are the same, but the decimal point in the obtained decimal number after division is shifted to the left by as many places as there are zeros followed by 1.

DIVISION OF INTEGERS

👐 **TRY THESE**   **(Text book Page No. 19)**

$36.7 \div 10 = 3.67$	$436.7 \div 10 = 43.67$	$2.3 \div 10 = 0.23$	$27.17 \div 10 = \underline{\textbf{2.717}}$
$36.7 \div 100 = 0.367$	$436.7 \div 100$ $= \underline{\textbf{4.367}}$	$2.3 \div 100$ $= \underline{\textbf{0.023}}$	$27.17 \div 10 = \underline{\textbf{2.717}}$
$36.7 \div 1000 = 0.0367$	$436.7 \div 1000$ $= \underline{\textbf{0.4367}}$	$2.3 \div 1000$ $= \underline{\textbf{0.0023}}$	$27.17 \div 1000$ $= \underline{\textbf{0.02717}}$

📖 **Sura's ➠ 7th Std - Mathematics**

👥 TRY THESE

Divide the following   (i) $17.237 \div 10$ (ii) $17.237 \div 100$ (iii) $17.237 \div 1000$

Sol. **(i)** $\quad 17.237 \div 10 \;=\; \dfrac{17237}{1000} \times \dfrac{1}{10} = \dfrac{17237}{10000} = 1.7237$

(ii) $\quad 17.237 \div 100 \;=\; \dfrac{17237}{1000} \times \dfrac{1}{100} = \dfrac{17237}{100000} = 0.17237$

(iii) $\quad 17.237 \div 1000 \;=\; \dfrac{17237}{1000} \times \dfrac{1}{1000} = \dfrac{17237}{1000000} = 0.017237$

👥 TRY THESE

Find the value of the following:

(i) $46.2 \div 3 = ?$ (ii) $71.6 \div 4 = ?$ (iii) $23.24 \div 2 = ?$
(iv) $127.35 \div 9 = ?$ (v) $47.201 \div 7 = ?$

$$
\begin{array}{r}
154 \\
3\overline{)462} \\
3 \\ \hline
16 \\
15 \\ \hline
12 \\
12 \\ \hline
0
\end{array}
$$

Sol. **(i)** $\quad 46.2 \div 3 \;=\; \dfrac{462}{10} \times \dfrac{1}{3}$

$\qquad\qquad\qquad\;\; = \dfrac{1}{10} \times \dfrac{462}{3} = \dfrac{1}{10} \times 154$

$\qquad\qquad\qquad\;\; = \dfrac{154}{10} = 15.4$

(ii) $\quad 71.6 \div 4 \;=\; \dfrac{716}{10} \times \dfrac{1}{4}$

$\qquad\qquad\qquad\;\; = \dfrac{1}{10} \times \dfrac{716}{4}$

$\qquad\qquad\qquad\;\; = \dfrac{1}{10} \times 179$

$\qquad\qquad\qquad\;\; = 17.9$

$$
\begin{array}{r}
179 \\
4\overline{)716} \\
4 \\ \hline
31 \\
28 \\ \hline
36 \\
36 \\ \hline
0
\end{array}
$$

(iii) $\quad 23.24 \div 2 \;=\; \dfrac{2324}{100} \times \dfrac{1}{2}$

$\qquad\qquad\qquad\;\; = \dfrac{2324}{2} \times \dfrac{1}{100} = 1162 \times \dfrac{1}{100}$

$\qquad\qquad\qquad\;\; = \dfrac{1162}{100}$

$\qquad\qquad\qquad\;\; = 11.62$

(iv) $\quad 127.35 \div 9 \;=\; \dfrac{12735}{100} \times \dfrac{1}{9}$

$\qquad\qquad\qquad\;\; = \dfrac{12735}{9} \times \dfrac{1}{100} = 1415 \times \dfrac{1}{100}$

$\qquad\qquad\qquad\;\; = \dfrac{1415}{100} = 14.15$

$$
\begin{array}{r}
1415 \\
9\overline{)12735} \\
9 \\ \hline
37 \\
36 \\ \hline
13 \\
9 \\ \hline
45 \\
45 \\ \hline
0
\end{array}
$$

Term III

(v)

$$47.201 \div 7 = \frac{47201}{1000} \times \frac{1}{7}$$

$$= \frac{47201}{7} \times \frac{1}{1000}$$

$$= 6743 \times \frac{1}{1000} = \frac{6743}{1000} = 6.743$$

```
        6743
   7) 47201
      42
      ──
      37
      37
      ──
      49
      ──
      30
      28
      ──
      21
      21
      ──
       0
```

TRY THESE

Divide the following (i) $\dfrac{9.25}{0.25}$ (ii) $\dfrac{8.6}{4.3}$ (iii) $\dfrac{44.1}{0.21}$ (iv) $\dfrac{9.6}{1.2}$

Sol. **(i)**

$$\frac{9.25}{0.25} = \frac{\left(\dfrac{925}{100}\right)}{\left(\dfrac{25}{100}\right)} = \frac{925}{100} \times \frac{100}{25} = \frac{925}{25} = 37$$

(ii)

$$\frac{8.6}{4.3} = \frac{\left(\dfrac{86}{10}\right)}{\left(\dfrac{43}{10}\right)} = \frac{86}{10} \times \frac{10}{43} = \frac{86}{43} = 2$$

(iii)

$$\frac{44.1}{0.21} = \frac{\left(\dfrac{441}{10}\right)}{\left(\dfrac{21}{100}\right)} = \frac{441}{10} \times \frac{100}{21} = 21 \times 10 = 210$$

(iv)

$$\frac{9.6}{1.2} = \frac{\left(\dfrac{96}{10}\right)}{\left(\dfrac{12}{10}\right)} = \frac{96}{10} \times \frac{10}{12} = 8$$

Think

The price of a tablet strip containing 30 tablets is 22.63 Then how will you find the price of each tablet?

Sol.

$$\text{Price of 30 tablets} = ₹\ 22.63 = ₹\ \frac{2263}{100}$$

$$\therefore\ \text{Price of 1 tablet} = \frac{\left(\dfrac{2263}{100}\right)}{30} = \frac{\left(\dfrac{2263}{100}\right)}{\left(\dfrac{30}{1}\right)}$$

$$= \frac{2263}{100} \times \frac{1}{30}$$

$$= \frac{2263}{30} \times \frac{1}{100} = \frac{2263}{3} \times \frac{1}{1000}$$

$$= 754.33 \times \frac{1}{1000} = \frac{754.33}{1000} = 0.75433$$

Price of each tablet is ₹ 0.7543

EXERCISE 1.4

1. **Simplify the following.**

(i) $0.6 \div 3$ (ii) $0.90 \div 5$ (iii) $4.08 \div 4$ (iv) $21.56 \div 7$

(v) $0.564 \div 6$ (vi) $41.36 \div 4$ (vii) $298.2 \div 3$

Sol. (i) $\quad 0.6 \div 3 = \dfrac{6}{10} \times \dfrac{1}{3} = \dfrac{6}{3} \times \dfrac{1}{10} = 2 \times \dfrac{1}{10} = \dfrac{2}{10} = 0.2$

(ii) $\quad 0.90 \div 5 = \dfrac{90}{100} \times \dfrac{1}{5} = \dfrac{90}{5} \times \dfrac{1}{100} = 18 \times \dfrac{1}{100} = \dfrac{18}{100} = 0.18$

(iii) $\quad 4.08 \div 4 = \dfrac{408}{100} \times \dfrac{1}{4} = \dfrac{408}{4} \times \dfrac{1}{100} = 102 \times \dfrac{1}{100} = \dfrac{102}{100} = 1.02$

(iv) $\quad 21.56 \div 7 = \dfrac{2156}{100} \times \dfrac{1}{7} = \dfrac{2156}{7} \times \dfrac{1}{100} = 308 \times \dfrac{1}{100} = \dfrac{308}{100} = 3.08$

(v) $\quad 0.564 \div 6 = \dfrac{564}{1000} \times \dfrac{1}{6} = \dfrac{564}{6} \times \dfrac{1}{1000} = \dfrac{94}{1000} = 0.094$

(vi) $\quad 41.36 \div 4 = \dfrac{4136}{100} \times \dfrac{1}{4} = \dfrac{4136}{4} \times \dfrac{1}{100} = \dfrac{1034}{100} = 10.34$

(vii) $\quad 298.2 \div 3 = \dfrac{2982}{10} \times \dfrac{1}{3} = \dfrac{2982}{3} \times \dfrac{1}{10} = \dfrac{994}{10} = 99.4$

2. **Simplify the following.**

(i) $5.7 \div 10$ (ii) $93.7 \div 10$ (iii) $0.9 \div 10$ (iv) $301.301 \div 10$

(v) $0.83 \div 10$ (vi) $0.062 \div 10$

Sol. (i) $\quad 5.7 \div 10 = \dfrac{57}{10} \times \dfrac{1}{10} = \dfrac{57}{100} = 0.57$

(ii) $\quad 93.7 \div 10 = \dfrac{937}{10} \times \dfrac{1}{10} = \dfrac{937}{100} = 9.37$

(iii) $\quad 0.9 \div 10 = \dfrac{9}{10} \times \dfrac{1}{10} = \dfrac{9}{100} = 0.09$

(iv) $\quad 301.301 \div 10 = \dfrac{301301}{1000} \times \dfrac{1}{10} = \dfrac{301301}{10000} = 30.1301$

(v) $\quad 0.83 \div 10 = \dfrac{83}{100} \times \dfrac{1}{10} = \dfrac{83}{1000} = 0.083$

(vi) $\quad 0.062 \div 10 = \dfrac{62}{1000} \times \dfrac{1}{10} = \dfrac{62}{10000} = 0.0062$

3. **Simplify the following.**

(i) $0.7 \div 100$ (ii) $3.8 \div 100$ (iii) $49.3 \div 100$ (iv) $463.85 \div 100$

(v) $0.3 \div 100$ (vi) $27.4 \div 100$

Sol. (i) $\quad 0.7 \div 100 = \dfrac{7}{10} \times \dfrac{1}{100} = \dfrac{7}{1000} = 0.007$

(ii) $\quad 3.8 \div 100 \quad = \quad \dfrac{38}{10} \times \dfrac{1}{100} = \dfrac{38}{1000} = 0.038$

(iii) $\quad 49.3 \div 100 \quad = \quad \dfrac{493}{10} \times \dfrac{1}{100} = \dfrac{493}{1000} = 0.493$

(iv) $\quad 463.85 \div 100 \quad = \quad \dfrac{46385}{100} \times \dfrac{1}{100} = \dfrac{46385}{10000} = 4.6385$

(v) $\quad 0.3 \div 100 \quad = \quad \dfrac{3}{10} \times \dfrac{1}{100} = \dfrac{3}{1000} = 0.003$

(vi) $\quad 27.4 \div 100 \quad = \quad \dfrac{274}{10} \times \dfrac{1}{100} = \dfrac{274}{1000} = 0.274$

4. Simplify the following.

(i) **18.9 ÷ 1000** (ii) **0.87 ÷ 1000** (iii) **49.3 ÷ 1000** (iv) **0.3 ÷ 1000**
(v) **382.4 ÷ 1000** (vi) **93.8 ÷ 1000**

Sol. (i) $\quad 18.9 \div 1000 \quad = \quad \dfrac{189}{10} \times \dfrac{1}{1000} = \dfrac{189}{10000} = 0.0189$

(ii) $\quad 0.87 \div 1000 \quad = \quad \dfrac{87}{100} \times \dfrac{1}{1000} = \dfrac{87}{100000} = 0.00087$

(iii) $\quad 49.3 \div 100 \quad = \quad \dfrac{493}{10} \times \dfrac{1}{100} = \dfrac{493}{1000} = 0.493$

(iv) $\quad 0.3 \div 1000 \quad = \quad \dfrac{3}{10} \times \dfrac{1}{1000} = \dfrac{3}{10000} = 0.0003$

(v) $\quad 382.4 \div 1000 \quad = \quad \dfrac{3824}{10} \times \dfrac{1}{1000} = \dfrac{3824}{10000} = 0.3824$

(vi) $\quad 93.8 \div 1000 \quad = \quad \dfrac{938}{10} \times \dfrac{1}{1000} = \dfrac{938}{10000} = 0.0938$

5. Simplify the following.

(i) **19.2 ÷ 2.4** (ii) **4.95 ÷ 0.5** (iii) **19.11 ÷ 1.3** (iv) **0.399 ÷ 2.1**
(v) **5.4 ÷ 0.6** (vi) **2.197 ÷1.3**

Sol. (i) $\quad 19.2 \div 2.4 \quad = \quad \dfrac{\left(\dfrac{192}{10}\right)}{\left(\dfrac{24}{10}\right)} = \dfrac{192}{10} \times \dfrac{10}{24} = \dfrac{192}{24} = 8$

(ii) $\quad 4.95 \div 0.5 \quad = \quad \dfrac{\left(\dfrac{495}{100}\right)}{\left(\dfrac{5}{10}\right)} = \dfrac{495}{100} \times \dfrac{10}{5} = \dfrac{495}{5} \times \dfrac{10}{100} = 99 \times \dfrac{1}{10} = \dfrac{99}{10} = 9.9$

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(iii) $19.11 \div 1.3$

$$= \frac{\left(\frac{19 \times 11}{100}\right)}{\left(\frac{13}{10}\right)} = \frac{1911}{100} \times \frac{10}{13}$$

$$= \frac{1911}{13} \times \frac{10}{100}$$

$$= 147 \times \frac{1}{10} = \frac{147}{10} = 14.7$$

(iv) $0.399 \div 2.1$

$$= \frac{\left(\frac{399}{1000}\right)}{\frac{21}{10}} = \frac{399}{1000} \times \frac{10}{21}$$

$$= \frac{399}{21} \times \frac{10}{1000}$$

$$= 19 \times \frac{1}{100} = \frac{19}{100} = 0.19$$

$$\begin{array}{r} 19 \\ 21\overline{)399} \\ \underline{21} \\ 189 \\ \underline{189} \\ 0 \end{array}$$

(v) $5.4 \div 0.6$

$$= \frac{\left(\frac{54}{10}\right)}{\left(\frac{6}{10}\right)} = \frac{54}{10} \times \frac{10}{6}$$

$$= \frac{54}{6} = 9$$

(vi) $2.197 \div 1.3$

$$= \frac{\left(\frac{2197}{1000}\right)}{\left(\frac{13}{10}\right)} = \frac{2197}{1000} \times \frac{10}{13}$$

$$= 169 \times \frac{1}{100}$$

$$= \frac{169}{100} = 1.69$$

$$\begin{array}{r} 169 \\ 13\overline{)2197} \\ \underline{13} \\ 89 \\ \underline{78} \\ 117 \\ \underline{117} \\ 0 \end{array}$$

6. **Divide 9.55 kg of sweet among 5 children. How much will each child get?**

Sol. Weight of the sweet $= 9.55$ kg

Weight of sweet for 5 children $= \frac{955}{100}$ kg

Weight of sweet for 1 child $= \frac{\left(\frac{955}{100}\right)}{5}$

$$= \frac{955}{100} \times \frac{1}{5} = \frac{955}{5} \times \frac{1}{100}$$

$$= \frac{191}{100} = 1.91$$

Each child will get 1.91 kg sweet.

Term III

7. **A vehicle covers a distance of 76.8 km for 1.2 litre of petrol. How much distance will it cover for one litre of petrol?**

Sol. For 1.2 litre of petrol the distance covered = 76.8 km

$$= \frac{768}{10} \text{ km}$$

∴ For 1 litre of petrol distance covered $= \dfrac{\left(\dfrac{768}{10}\right)}{1.2} \text{ km}$

$$= \frac{\left(\dfrac{768}{10}\right)}{\left(\dfrac{12}{10}\right)} = \frac{768}{10} \times \frac{10}{12}$$

$$= \frac{768}{12} \times \frac{10}{10} = 64 \text{ km}$$

For 1 litre of petrol distance covered = 64 km.

8. **Cost of levelling a land at the rate of ₹ 15.50 sq. ft is ₹ 10,075. Find the area of the land.**

Sol. Cost of levelling the entire land = ₹ 10, 075

Cost of levelling 1 sq. ft = ₹ 15.50

∴ Area of the land $= \dfrac{\text{Cost of levelling entire land}}{\text{Cost of levelling 1 sq. ft.}}$

$$= \frac{10075}{15.50} \times \frac{100}{100} = \frac{10075 \times 100}{15.50 \times 100}$$

$$= \frac{1007500}{1550} \qquad = \frac{100750}{155} = 650$$

∴ Area of the land = 650 sq.ft.

$$\begin{array}{r} \overset{650}{\cancel{20150}} \\ \underline{\cancel{100750}} \\ \cancel{155}\,{}_{31}\,{}_1 \end{array}$$

9. **The cost of 28 books are ₹ 1506.4. Find the cost of one book.**

Sol. Cost of 28 books = ₹ 1506.4

Cost of 1 book $= \dfrac{1506.4}{28}$

$$= \frac{\dfrac{15064}{10}}{\dfrac{28}{1}} = \frac{15064}{10} \times \frac{1}{28}$$

$$= \frac{15064}{28} \times \frac{1}{10} = 538 \times \frac{1}{10}$$

$$= \frac{538}{10} = ₹ 53.80$$

Cost of 1 book = ₹ 53.80

$$\begin{array}{r} \overset{538}{\overset{3766}{\cancel{15064}}} \\ \underline{} \\ \cancel{28}\,{}_{7}\,{}_1 \end{array}$$

10. The product of two numbers is 40.376. One number is 14.42. Find the other number.

Sol. Product of two numbers $= 40.376$

One number $= 14.42$

Another number $= \dfrac{40.376}{14.42} = \dfrac{\frac{40376}{1000}}{\frac{1442}{100}}$

$= \dfrac{40376}{1000} \times \dfrac{100}{1442}$

$= \dfrac{40376}{1442} \times \dfrac{100}{1000}$

$= 28 \times \dfrac{1}{10} = \dfrac{28}{10} = 2.8$

Other number $= 2.8$

```
   28
 2884
20188
40376
─────
 1442
  721
  103
    1
```

OBJECTIVE TYPE QUESTIONS

11. $5.6 \div 0.5 = ?$

(i) 11.4 (ii) 10.4 (iii) 0.14 (iv) 11.2

[Ans: (iv) 11.2]

Hint : $\dfrac{5.6}{0.5} = \dfrac{56}{5}$

$= 11.2$

```
    11.2
 5) 56
    5
    06
    5
    10
    10
     0
```

12. $2.01 \div 0.03 = ?$

(i) 6.7 (ii) 67.0 (iii) 0.67 (iv) 0.067

[Ans: (ii) 67.0]

Hint : $\dfrac{2.01}{0.03} = \dfrac{201}{3}$

$= 67$

```
    67
 3) 201
    18
    21
    21
     0
```

13. $0.05 \div 0.5 = ?$

(i) 0.01 (ii) 0.1 (iii) 0.10 (iv) 1.0

[Ans: (ii) 0.1]

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Hint :

$$\frac{0.05}{0.5} = \frac{\frac{5}{100}}{\frac{5}{10}} = \frac{5}{100} \times \frac{10}{5} = \frac{1}{10}$$

$$= 0.1$$

ADDITIONAL QUESTIONS

1. **A wire of length 363.987m is cut into 30 pieces. What is the length of each piece?**

Sol.   Length of the wire $= 363.987$m

i.e Total length of 30 pieces $= \dfrac{363987}{1000}$ m

∴ Length of 1 piece $= \dfrac{\left(\dfrac{363987}{1000}\right)}{30} = \dfrac{363987}{1000} \times \dfrac{1}{30} = \dfrac{363987}{30} \times \dfrac{1}{1000}$

$= 12132.9 \times \dfrac{1}{1000}$

Length of 1 piece of wire $= 12.1329$m

2. **A cake of 50kg needs 23.4 kg sugar. Find the weight of cake made by 1 kg of sugar.**

Sol.   Weight of cake made using 23.4 kg sugar $= 50$ kg

Weight of cake made using 1 kg sugar $= \dfrac{50}{23.4}$

$= \dfrac{50}{23.4} \times \dfrac{10}{10}$

$= \dfrac{500}{234} = 2.1367$ kg

$\simeq 2.14$ kg

Weight of cake made using 1 kg sugar $= 2.14$ kg.

3. **A pack of 20 pencils cost ₹ 94.4. What is the cost of each pencil?**

Sol.   Cost of 20 pencils $= ₹94.4$

Cost of 1 pencil $= \dfrac{94.4}{20} = \dfrac{{944}/{10}}{{20}/{1}}$

$= \dfrac{944}{10} \times \dfrac{1}{20} = \dfrac{944}{20} \times \dfrac{1}{10}$

$= \dfrac{47.2}{10} = 4.72$

∴ Cost of 1 pencil $= ₹ 4.72$

EXERCISE 1.5

Miscellaneous Practice problems

1. **Malini bought three ribbon of lengths 13.92 m, 11.5 m and 10.64 m. Find the total length of the ribbons?**

Sol. Length of ribbon 1 = 13.92 m
Length of ribbon 2 = 11.50 m
Length of ribbon 3 = 10.64 m

Total Length of the ribbons = 13.92 m + 11.5 m + 10.64 m = 36.06 m
Total length of the ribbons = 36.06m

```
   13.92
+  11.50
   10.64
   36.06
```

2. **Chitra has bought 10 kg 35 g of ghee for preparing sweets. She used 8 kg 59 g of ghee. How much ghee will be left?**

Sol. Total weight of ghee bought = 10 kg 35 g
Weight of ghee used = 8 kg 59 g
Weight of ghee left = 10.35 kg – 8.59 kg = 1.76 kg
∴ Weight of ghee left = 1 kg 76 g = 1.76 kg

```
   10.35
−   8.59
    1.76
```

3. **If the capacity of a milk can is 2.53 l, then how much milk is required to fill 8 such cans?**

Sol. Capacity of 1 milk can = 2.53 l
∴ Capacity of 8 milk cans = 2.53 l × 8 = 20.24 l
To fill 8 cans 20.24 l of milk is required.

```
    2.53
×      8
   20.24
```

4. **A basket of orange weighs 22.5 kg. If each family requires 2.5 kg of orange, how many families can share?**

Sol. Total weight of orange = 22.5 kg
Weight of orange required for 1 family = 2.5 kg
∴ Number of families sharing orange = 22.5 kg ÷ 2.5 kg

$$= \frac{22.5}{2.5} = \frac{22.5}{2.5} \times \frac{10}{10} = \frac{225}{25} = 9$$

∴ 9 families can share the oranges.

5. **A baker uses 3.924 kg of sugar to bake 10 cakes of equal size. How much sugar is used in each cake?**

Sol. For 10 cakes sugar required = 3.924 kg
For 1 cake sugar required = 3.924 ÷ 10 = $\frac{3.924}{10}$ = 0.3924 kg
For 1 cake sugar required = 0.3924 kg.

Term III

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Chapter -1 - Number System

6. **Evaluate: (i) 26.13 × 4.6 (ii) 3.628 + 31.73 − 2.1**

Sol. **(i)** 26.13×4.6

$$26.13 \times 4.6 = 120.198$$

× 26.13	2 decimal places
4.6	1 decimal place
15678	
10452	
120.198	3 decimal places

(ii) $3.628 + 31.73 - 2.1 = 33.258$

+	3.628
	31.73
−	35.358
	2.1
	33.258

7. **Murugan bought some bags of vegetables. Each bag weighs 20.55 kg. If the total weight of all the bags is 308.25 kg, how many bags did he buy?**

Sol. Total weight of all bags = 308.25 kg

Weight of 1 bag = 20.55 kg

∴ Number of bags $= \dfrac{\text{Total weight}}{\text{Weight of 1 bag}}$

$$= \frac{308 \cdot 25}{20 \cdot 55} = \frac{\left(\dfrac{30825}{100}\right)}{\left(\dfrac{2055}{100}\right)}$$

$$= \frac{30825}{100} \times \frac{100}{2055}$$

$$= \frac{\overset{2055}{\cancel{30825}}}{\underset{137}{\cancel{2055}}} = \frac{2055}{137} = 15$$

∴ He bought 15 bags.

```
      2055
      6165
     30825
      2055
       411
       137
```

```
          15
  137) 2055
       137
       685
       685
         0
```

8. **A man walks around a circular park of distance 23.761 m. How much distance will he cover in 100 rounds?**

Sol. In 1 round distance covered = 23.761 m

∴ In 100 rounds distance = 23.761×100

= 2376.1 m

∴ In 100 round he covers 2376.1 m.

9. **How much 0.0543 is greater than 0.002?**

Sol. Greater number = 0.0543 (−)

Smaller number = 0.0020

= 0.0523

∴ Required answer is 0.0523

10. **A printer can print 15 pages per minute. How many pages can it print in 4.6 minutes?**

Sol. In 1 minute the pages printed   = 15

In 4.6 minutes the pages printed = 15×4.6

$\qquad\qquad\qquad\qquad\qquad$ = 69

The printer prints 69 pages.

4.6	1 decimal place
15	
230	
460	
69.0	1 decimal place

Challenge Problems

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11. **The distance travelled by Prabhu from home to Yoga centre is 102 m and from Yoga centre to school is 165 m. What is the total distance travelled by him in kilometres (in decimal form)?**

Sol. Distance from home to yoga centre $\quad = \quad 102$ m (+)

Distance from yoga centre to school $\quad = \quad \underline{165 \text{ m}}$

$\qquad\qquad$ Total distance $\quad = \quad \underline{267 \text{ m}}$

$\qquad\qquad$ 1000 meters $\quad = \quad 1$ km

$\qquad \therefore 267$ metres $\quad = \quad \dfrac{267}{1000}$ km

$\qquad\qquad\qquad\qquad\qquad = \quad 0.267$ km

$\therefore \qquad$ Total distance travelled $\quad = \quad 0.267$ km

12. **Anbu and Mala travelled from A to C in two different routes. Anbu travelled from place A to place B and from there to place C. A is 8.3 km from B and B is 15.6 km from C. Mala travelled from place A to place D and from there to place C. D is 7.5 km from A and C is 16.9 km from D. Who travelled more and by how much distance?**

Sol. **Distance travelled by Anbu:**

$\qquad\qquad$ From place A to place B $\quad = \quad 8.3$ km

$\qquad$ Distance from place B to place C $\quad = \quad 15.6$ km

$\qquad \therefore$ Total distance travelled by Anbu $\quad = \quad 8.3 + 15.6$

$\qquad\qquad\qquad\qquad\qquad\qquad = \quad 23.9$ km

Distance travlled by Mala:

$\qquad$ Distance travelled place A to D $= \quad 7.5$ km

$\qquad$ Distance from place D to place C $= \quad 16.9$ km

$\qquad$ Total distance travelled by mala $= \quad (7.5 + 16.9)$ km $= 24.4$ km

$\qquad\qquad\qquad\qquad 24.4 \quad > \quad 23.9$

$\therefore$ Mala travelled more distance. She travelled $(24.4 - 23.9)$ km more i.e she travelled 0.5 km more.

Term III

13. **Ramesh paid ₹ 97.75 per hour for a taxi and he used 35 hours in a week. How much he has to pay totally as taxi fare for a week?**

Sol.

Payment for the taxi for an hour $=$ ₹ 97.75

Total hours the taxi was used $=$ 35 hrs.

∴ Total payment for the taxi for the week

$=$ 97.75×35

$=$ 3421.25

Total payment for a week $=$ ₹ 3421.25

97.75	2 decimal places
35	
48875	
293250	
3421.25	2 decimal places

14. **An Aeroplane travelled 2781.20 kms in 6 hours. Find the average speed of the aeroplane in Km/hr.**

Sol. In 6 hours the distance travelled $=$ 2781.20 km

In 1 hour the distance travelled $=$ $\dfrac{2781.20}{6}$ km

$$= \dfrac{\left({278120}/{100} \right)}{\left({6}/{1} \right)}$$

$$= \dfrac{278120}{100} \times \dfrac{1}{6}$$

$$= \dfrac{278120}{6} \times \dfrac{1}{100}$$

$$= 46353 \times \dfrac{1}{100}$$

$$= 463.53 \text{ km}$$

Average speed of the aroplane = 463.53 km/hr.

15. **Kumar's car gives 12.6 km mileage per litre. If his fuel tank holds 25.8 litres then how far can he travel?**

Sol. Distance travelled with 1 litre fuel $=$ 12.6 km

∴ with 25.8 litres distance travelled $=$ 12.6×25.8

$=$ 325.08 km

12.6	1 decimal place
× 25.8	1 decimal place
1008	
6300	
25200	
325.08	2 decimal places

The car can travel 325.08 km

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Sura's ➠ 7th Std - Mathematics

UNIT TEXT

Time: 1 hrs   **Max Marks : 25**

I.   Fill in the blanks.   **5 × 1 = 5**

1.   67.4 rounds to the nearest whole number is _____.

2.   87.006 rounds to the nearest hundredths place is _____.

3.   80.0097 rounds to the nearest thousands place is _____.

4.   9.23 round to 1 place of decimal is _____.

5.   8.764 + 9.32 = _____.

II.   Answer the following questions.   **5 × 2 = 10**

6.   What should subtracted from 7.439 to get 2.97?

7.   Cost of 5 kg apple is ₹ 498.976. Cost of 5 kg orange is ₹ 270.730. Find the total amount to be paid?

8.   A wheel covers 50.3 cm in one rotation. Find the distance covered on 10 rotations.

9.   Find the area of a square if one side is 4.93 cm.

10.   If the area of a room is 110.32 sq.ft. If it is covered by 20 tiles perfectly what is the area of 1 tile?

III.   Answer the following questions.   **2 × 5 = 10**

11.   Simplify: 18.234 + 16.7 – 9.39.

12.   Simplify: 18.23 × 6.2 ÷ 3.2.

ANSWERS

I.   **1.**   67   **2.**   87.01

         3.   80.010   **4.**   9.2

         5.   18.084

II. **6.**   4.469   **7.**   ₹ 769.706

         8.   503 cm   **9.**   24.3049 cm²

         10. 5.516 sq.ft.

III. **11.** 25.544

         12. 35.520625

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Term III