



1. Revision

1. (a) Four lakh twenty-five thousand seven hundred thirty-two
 (b) Seven lakh eighty-two thousand one
 (c) Seven lakh fifteen thousand four hundred thirty-two
 (d) Three lakh twenty-five thousand seven hundred forty-two
 (e) Three lakh twenty-five thousand seven hundred twenty-four
2. (a) 615220 (b) 1003639 (c) 9264292
3. (a) Seven hundred forty-two thousand one
 (b) Three hundred twenty-five thousand seven hundred one
 (c) Seven hundred thousand eight
4. (a) The place value of 9 in 3,09,812 is 90000.
 The face value of 9 in 3,09,812 is 9.
 \therefore Difference = $90000 - 9 = 89991$
 (b) The place value of 1 in 17,68,905 is 10,00,000.
 The place value of 6 in 17,68,905 is 60,000
 \therefore Difference = $10,00,000 - 60000 = 940,000$
 (c) The place value of 7 in 72,08,763 is 700.
 Another, the place value of 7 in 72,08,763 is 70,00,000
 \therefore Difference = $70,00,000 - 700 = 6999300$
5. (a) $80,656 = 8 \times 10000 + 0 \times 1000 + 6 \times 100 + 5 \times 10 + 6 \times 1$
 (b) $4,05,077 = 4 \times 100000 + 0 \times 10000 + 5 \times 1000 + 0 \times 100 + 7$
 $\qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \times 10 + 7 \times 1$
 (c) $18,65,540 = 1 \times 1000000 + 8 \times 100000 + 6 \times 10000 + 5 \times 1000$
 $\qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad + 5 \times 100 + 4 \times 10 + 0 \times 1$
6. (a) 2,08,006 (b) 10,10,550 (c) 23,04,004
7. (a) Arrange the digits, smallest to the greatest then 0, 1, 3, 5, 9.
 Here, 0 can't be on ten thousand place, so the smallest number is 10359.
 (b) Arrange the digits greatest to smallest then 8, 5, 2, 0.
 Here, the greatest number is 8520.

8. (a) Arrange the digits, smallest to greatest then 0, 5, 5, 6.
Here, 0 cannot be on thousand place, so the smallest number is 5056.

(b) Arrange the digit, greatest to smallest then 9, 6, 6, 3.
So, the greatest number is 9663.

9. (a) Arrange the numerators into smallest to greatest number, then, 1, 2, 3, 4, 5.

So, the fraction in ascending order is :

$$\frac{1}{7}, \frac{2}{7}, \frac{3}{7}, \frac{4}{7}, \frac{5}{7}$$

(b) Arrange the numerators into smallest to greatest number, then, 1, 3, 5, 7.

So, the fractions in ascending order is : $\frac{1}{8}, \frac{3}{8}, \frac{5}{8}, \frac{7}{8}$.

10. (a) Arrange the numerators into greatest to smallest numbers, then, 8, 6, 5, 3, 2.

So, the fractions in descending order is :

$$\frac{8}{13}, \frac{6}{13}, \frac{5}{13}, \frac{3}{13}, \frac{2}{13}$$

(b) Arrange the numerators into greatest to smallest numbers, then, 7, 5, 3, 1.

So, the fractions in descending order is : $\frac{7}{12}, \frac{5}{12}, \frac{3}{12}, \frac{1}{12}$.

11. (a) 1,74,918 (b) 6,07,437 (c) 21,76,600

12. (a) 2,35,755 (b) 2,67,027 (c) 14,54,506

13. (a) 2,06,353 (b) 22,95,986 (c) 26,82,090

14. (a) 5,703 (b) 66 (c) 1,200

15. (a) $24 = 1, 2, 3, 4, 6, 12, 24$

(b) $64 = 1, 2, 4, 8, 16, 32, 64$

(c) $96 = 1, 2, 3, 4, 6, 8, 12, 16, 24, 32, 48, 96$

16. (a) The first three multiples of 5 are 5, 10, 15.

(b) The first three multiples of 10 are 10, 20, 30.

(c) The first three multiples of 12 are 12, 24, 36.

17. (a) The HCF of 720 and 396 is

2	396
2	198
3	99
3	33
11	11
	1

2	720
2	360
2	180
2	90
3	45
3	15
5	5
	1

$$396 = 2 \times 2 \times 3 \times 3 \times 11$$

$$720 = 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 5$$

$$\text{HCF} = 2 \times 2 \times 3 \times 3 = 4 \times 9 = 36$$

(b) HCF of 80, 96 and 360.

2	80
2	40
2	20
2	10
5	5
	1

2	96
2	48
2	24
2	12
2	6
3	3
	1

2	360
2	180
2	90
3	45
3	15
5	5
	1

$$\text{HCF} = 2 \times 2 \times 2 = 8$$

18. (a) The LCM of 4, 5 and 8 is

2	4, 5, 8
2	2, 5, 4
2	1, 5, 2
5	1, 5, 1
	1, 1, 1

$$\text{LCM} = 2 \times 2 \times 2 \times 5 = 40$$

(b) The LCM of 8, 10, 12 is

2	8, 10, 12
2	4, 5, 6
2	2, 5, 3
3	1, 5, 3
5	1, 5, 1
	1, 1, 1

$$\therefore \text{LCM} = 2 \times 2 \times 2 \times 3 \times 5 = 120$$

19. $13 + 6 \div 2 + 5 \times 4 = 13 + 3 + 20 = 16 + 20 = 36$

20. (a) $\frac{4}{17} + \frac{7}{17} + \frac{3}{17} = \frac{4+7+3}{17} = \frac{14}{17}$

(b) $1\frac{2}{7} + \frac{3}{7} + 2\frac{5}{7} = \frac{9}{7} + \frac{3}{7} + \frac{19}{7} = \frac{9+3+19}{7} = \frac{31}{7} = 4\frac{3}{7}$

21. (a) $\frac{8}{9} - \frac{2}{9} = \frac{8-2}{9} = \frac{6}{9} = \frac{2}{3}$

(b) $3\frac{1}{7} - 2\frac{1}{7} = \frac{22}{7} - \frac{15}{7} = \frac{22-15}{7} = \frac{7}{7} = 1$

22. (a) $0.1 = \frac{1}{10}$

(b) $0.03 = \frac{3}{100}$

(c) $1.01 = \frac{101}{100}$

(d) $0.007 = \frac{7}{1000}$

23. A bundle contains 162 five-rupees notes.

Total money in the bundles = $162 \times ₹ 5 = ₹ 810$

24. The distance between the first post and the last post is 73 m 50 cm.

The distance between any two posts placed one after the other

$$= \frac{73 \text{ m } 50 \text{ cm}}{7} = 10 \text{ m } 50 \text{ cm}$$

25. The cost of 5 copies of a book = ₹ 125

The cost of 1 copy = $\frac{125}{5} = ₹ 25$

The cost of a dozen copies of the same book = $₹ 25 \times 12 = ₹ 300$

26. Ashish started writing a letter at 9:25 am.

He finished writing at 11:05 am.

Total time taken to write the letter = 11 h 05 m

$$\begin{array}{r} 11 \text{ h } 05 \text{ m} \\ - 9 \text{ h } 25 \text{ m} \\ \hline \end{array}$$

$$1 \text{ h } 40 \text{ m}$$

27. An electrician bought wire = 400 metres

Total sold wire to customer = 43 m 75 cm

$$\begin{array}{r} 400 \text{ m} \\ - 43 \text{ m } 75 \text{ cm} \\ \hline \end{array}$$

$$356 \text{ m } 25 \text{ cm}$$

$$\begin{aligned}
 \therefore \text{ The length of wire left} &= 400 \text{ m} - 202 \text{ m } 25 \text{ cm} \\
 &= 400 \text{ m } 00 \text{ cm} \\
 &\quad - 202 \text{ m } 25 \text{ cm} \\
 \hline
 &197 \text{ m } 75 \text{ cm}
 \end{aligned}$$

28. The weight of a full tin = 15 kg 200 g

Empty tin weighs = 1 kg 375 g

The net weight of the pulses contained in the tin = 15 kg 200 g

$$\begin{aligned}
 &15 \text{ kg } 200 \text{ g} \\
 &\quad - 1 \text{ kg } 375 \text{ g} \\
 \hline
 &13 \text{ kg } 825 \text{ g}
 \end{aligned}$$

29. The difference between the supplementary angle and the measure angle = $180^\circ - 75^\circ = 105^\circ$

The difference between the complementary angle and the measure angle = $90^\circ - 75^\circ = 15^\circ$

30. Do yourself

31. The relation between the sides of square i.e. all sides are equal. And the angles of a square are all of 90° .

2. Large Numbers

Exercise 2

1. (a) 6,23,974 (b) 37,68,954
(c) 5,26,73,894 (d) 43,06,15,029
2. (a) 74,10,507 — Seventy-four lakh ten thousand five hundred seven
(b) 39,00,302 — Thirty-nine lakh three hundred two
(c) 2,41,05,063 — Two crore forty-one lakh five thousand sixty-three
(d) 10,00,53,109 — Ten crore fifty three thousand one hundred nine
3. (a) 92,05,055 (b) 6,65,20,716
(c) 9,19,09,990 (d) 12,10,00,365
4. $6 \times 100000000 + 4 + 10000000 + 1 \times 1000000 + 9 \times 100000 + 7$
 $\times 10000 + 0 \times 1000 + 5 \times 100 + 2 \times 10 + 6$

5. (a) $\underline{5}90713568$ — 90000000
 (b) $7635\underline{7}09412$ — 700000
 (c) $\underline{8}20307514$ — 800000000
 (d) $81\underline{3}605247$ — 3000000
6. (a) $5,29,347$ — $5 \times 100000 + 2 \times 10000 + 9 \times 1000 + 3 \times 100 + 4 \times 10 + 7$
 (b) $23,09,519$ — $2 \times 1000000 + 3 \times 100000 + 0 \times 10000 + 9 \times 1000 + 5 \times 100 + 1 \times 10 + 9$
 (c) $9,72,34,026$ — $9 \times 10000000 + 7 \times 1000000 + 2 \times 100000 + 3 \times 10000 + 4 \times 1000 + 0 \times 100 + 2 \times 10 + 6$
 (d) $13,06,19,804$ — $1 \times 100000000 + 3 \times 10000000 + 0 \times 1000000 + 6 \times 100000 + 1 \times 10000 + 9 \times 1000 + 8 \times 100 + 0 \times 10 + 4$
7. (a) 376,976 (b) 6,830,484 (c) 20,202,202
8. (a) 35684129 — 3,56,84,129
 (b) 50968302 — 5,09,68,302
9. (a) 25,863,475 — Twenty-five million eight hundred sixty-three thousand four hundred seventy four.
 (b) 30,807,541 — Thirty million eight hundred seven thousand five hundred forty-one
10. (a) 64,119,018 (b) 289,069,048 (c) 105,108,007
11. (a) $1002456 \gt 987896$ (b) $23507104 \gt 14536523$
 (c) $54836903 \lt 103213102$ (d) $203645817 \gt 164786938$
12. (a) The given numbers are :
 12965784, 3076897, 129654503, 2789988, 21345603
 Arrange the numbers, greatest to smallest, we get
 12965503, 21345603, 12965784, 3076897, 2789988
 (b) Arrange the numbers, greatest to smallest, we get
 245370119, 245368009, 9216723, 53791325, 45639918
 (c) Arrange the numbers, greatest to smallest, we get
 627905623, 627905480, 62791023, 62790931, 62790568

13. (a) Arrange the numbers, smallest to greatest, we get
2786789, 2876879, 14865710, 20507106, 30008215
- (b) Arrange the numbers, smallest to greatest, we get
9367839, 9368516, 10540603, 10541201, 91032401
- (c) Arrange the numbers, smallest to the greatest, we get
2537928, 14035710, 20547946, 100515602, 101002301
14. (a) The largest number among the given numbers is 307482134
- (b) The largest number among the given numbers is 102240003
- (c) The largest number among the given numbers is 101010706

Check Yourself

1. (a) 1 crore = 10 million.
- (b) The place value of **Unit number** is always the same as its face value.
- (c) There are 7 zeros in 30 million.
- (d) There are 7 zeros in 8 crore.
- (e) When 1 is added to a given number, we get the **successor** of the given number.
2. (a) → (iv) (b) → (v) (c) → (iii)
(d) → (ii) (e) → (i)
3. (a) True (b) True (c) False (d) False.
4. (a) → (iv) (b) → (i) (c) → (i)
(d) → (i) (e) → (ii)

3. Rounding Numbers

Exercise 3

1. (a) 81 is rounded to 80 upto nearest ten.
- (b) 478 is rounded to 480 upto nearest ten.
- (c) 4232 is rounded to 4230 upto nearest ten.
- (d) 20306 is round to 20310 upto nearest ten.
2. (a) 415 is rounded to 400 upto nearest hundred.
- (b) 5650 is rounded to 5700 upto nearest hundred.

- (c) 16309 is rounded to 16300 upto nearest hundred.
(d) 110111 is rounded 110100 upto nearest hundred.
3. (a) 6367 is rounded to 6000 upto nearest thousand.
(b) 13492 is rounded to 13000 upto nearest thousand.
(c) 218925 is rounded to 219000 upto nearest thousand.
(d) 18677299 is rounded to 18677000 upto nearest thousand.
4. (a) 16745 is rounded to 20000 upto nearest ten-thousand.
(b) 347126 is rounded to 350000 upto nearest ten-thousand.
(c) 462789 is rounded to 460000 upto nearest ten-thousand.
(d) 1570358 is rounded to 1570000 upto nearest ten-thousand.
5. (a) 138964 is rounded to 100000 upto nearest lakh.
(b) 347589 is rounded to 350000 upto nearest lakh.
(c) 461308 is rounded to 500000 upto nearest lakh.
(d) 782615 is rounded to 800000 upto nearest lakh.
6. (a) 6.3 is rounded to 6.0 upto nearest one.
(b) 16.8 is rounded to 17.0 upto nearest one.
(c) 10.05 is rounded to 10.0 upto nearest one.
(d) 76.703 is rounded to 77.0 upto nearest one.
7. (a) 9.65 is rounded to 9.7 upto nearest one decimal place.
(b) 10.347 is rounded to 10.3 upto nearest one decimal place.
(c) 86.813 is rounded to 86.8 upto nearest one decimal place.
(d) 102.382 is rounded to 102.4 upto nearest one decimal place.
8. (a) 0.706 is rounded to 0.71 upto nearest two decimal places.
(b) 5.238 is rounded to 5.24 upto nearest two decimal places.
(c) 11.415 is rounded to 11.42 upto nearest two decimal places.
(d) 103.7651 is rounded to 103.77 upto nearest two decimal places.
9. (a) 0.7894 is rounded to 0.789 upto nearest three decimal places.
(b) 2.1635 is rounded to 2.164 upto nearest three decimal places.
(c) 78.4728 is rounded to 78.473 upto nearest three decimal places.
(d) 19.01472 is rounded to 19.015 upto nearest three decimal places.

10. (a) $\frac{5}{13} = 0.385$

(b) $\frac{6}{7} = 0.857$

(c) $\frac{6}{13} = 0.461$

(d) $10\frac{2}{3} = \frac{32}{3} = 10.666$

Check Yourself

1. (a) 63 rounded off to the nearest ten is **60**.
(b) 571 rounded off to the nearest hundred is **600**.
(c) 81504 rounded off to the nearest thousand is **82000**.
(d) 356791 rounded off to the nearest ten-thousand is **360000**.
2. (a) True (b) True (c) True (d) True
3. (a) → (ii), (b) → (i), (c) → (iii), (d) → (iv)
4. (a) (ii) 3900 (b) (iv) 5400
(c) (iii) 8800 (d) (iii) 32.740

4. Roman Numerals

Exercise 4

1. (a) V = 5 (b) X = 10 (c) L = 50
(d) C = 100 (e) D = 500 (f) M = 1000
2. (a) $55 = 50 + 5 = L + V = LV$
(b) $80 = 50 + 30 = L + XXX = LXXX$
(c) $83 = 50 + 30 + 3 = L + XXX + III = LXXXIII$
(d) $99 = 90 + 9 = XC + IX = XCIX$
(e) $103 = 100 + 3 = C + III = CIII$
(f) $305 = 300 + 5 = CCC + V = CCCV$
(g) $801 = 500 + 300 + 1 = DCCCI$
(h) $1043 = 1000 + 40 + 3 = M + XL + III = MXLIII$
3. (a) $XLV = XL + V = (50 - 10) + 5 = 40 + 5 = 45$
(b) $LXIII = 50 + 8 = 58$
(c) $LXXX = 50 + 30 = 80$
(d) $CCXC = C + C + XC = 100 + 100 + (100 - 10) = 290$
(e) D = 500
(f) $CMXII = CM + XII = (1000 - 100) + 12 = 900 + 12 = 912$

$$(g) \text{ MMDCXXIX} = M + M + D + C + \text{XXIX}$$

$$= 1000 + 1000 + 500 + 100 + 29 = 2629$$

$$(h) \text{ MMMCDL} = M + M + M + \text{CD} + L$$

$$= 1000 + 1000 + 1000 + 500 - 100 + 50 = 3450$$

4. (a) $\text{XL} = (50 - 10) = 40 \Rightarrow \text{LIII} = 50 + 3 = 53$

$$\therefore \text{XL} < \text{LIII}$$

(b) $\text{LXXIX} = L + \text{XXIX} = 50 + 29 = 79 \Rightarrow \text{XC} = (100 - 10) = 90$

$$\therefore \text{LXXIX} < \text{XC}$$

(c) $\text{CXX} = 100 + 20 = 120 \Rightarrow \text{CXXIX} = 100 + 29 = 129$

$$\therefore \text{CXX} < \text{CXXIX}$$

(d) $\text{MC} = 1000 + 100 = 1100$

$$\text{MLXXX} = 1000 + 50 + 30 = 1080$$

$$\therefore \text{MC} > \text{MLXXX}$$

(e) $\text{CMXXIX} = (1000 - 100) + 20 + 9 = 929$

$$\text{CMXVII} = (1000 - 100) + 17 = 917$$

$$\therefore \text{CMXXIX} > \text{CMXVII}$$

(f) $\text{XCIII} = (100 - 10) + 3 = 93$

$$\text{CXIII} = 100 + 13 = 113$$

$$\therefore \text{XCIII} < \text{CXIII}$$

5. (a) $300 + 60 + 3 = \text{CCC} + \text{LX} + \text{III} = \text{CCCLXIII}$

(b) $500 + 70 + 8 = \text{D} + \text{LXX} + \text{VIII} = \text{DLXXVIII}$

(c) $700 + 40 + 9 = 500 + 200 + 40 + 9$

$$= \text{D} + \text{CC} + \text{XL} + \text{IX} = \text{DCCXLIX}$$

(d) $800 + 90 + 1 = 500 + 300 + 90 + 1$

$$= \text{D} + \text{CCC} + \text{XC} + \text{I} = \text{DCCCXCI}$$

6. (a) $198 = 100 + 90 + 8 = \text{C} + \text{XC} + \text{VIII} = \text{CXCVIII}$

(b) $\text{CCXCVI} = 100 + 100 + 90 + 6 = 296$

(c) $229 = 100 + 100 + 29 = \text{C} + \text{C} + \text{XXIX} = \text{CCXXIX}$

(d) $350 = 300 + 50 = \text{CCC} + \text{L} = \text{CCCL}$

(e) $\text{CCCXLIX} = 100 + 100 + 100 + 40 + 9 = 349$

(g) $430 = 400 + 30 = \text{CD} + \text{XXX} = \text{CDXXX}$

(h) $\text{CDIV} = (500 - 100) + 4 = 404$

7. (a) $XC = (100 - 10) = 90$ $XV = 10 + 5 = 15$
 $XL = (50 - 10) = 40$ $X = 10$
 $V = 5$ $C = 100$
The descending order is : C, XC, XL, XV, X, V
- (b) $XLII = (50 - 10) + 2 = 42$ $XCIX = (100 - 10) + 9 = 99$
 $LX = 50 + 10 = 60$ $XVII = 17$
 $LIX = 59$ $LXXV = 50 + 10 + 10 + 5 = 75$
The descending order is : XCIX, LXXV, LX, LIX, XVII
8. (a) IX, XIX, XLIII, XCII, LXXXII
 $IX = 9$ $XIX = 19,$
 $XLIII = 43,$ $XCII = 92,$
 $LXXXII = 50 + 32 = 82$
 $\therefore IX, XIX, XLII, LXXXII, XCII$
- (b) $LIV = 54, LXVI = 50 + 16 = 66$
 $XVI = 16, XXX = 30, XCIX = 99, XLIX = 49$
 $\therefore XVI, XXX, XLIX, LIV, LXVI, XCIX$
9. (a) $XX = 20$ (b) $II = 2$
(c) $XXX = 30$ (d) $XC = (100 - 10) = 90$
(e) $LV = 50 + 5 = 55$ (f) $XCIV = (100 - 10) + 5 = 95$
10. (a) $XXXVIII = 38 \Rightarrow XXV = 25$
 $\therefore XXXVIII + XXV = 38 + 25 = 63 = LXIII$
- (b) $LXXXVI = 50 + 30 + 6 = 86 \Rightarrow XI = 11$
 $\therefore LXXXVI + XI = 86 + 11 = 97 = XCVII$
- (c) $XC = 100 - 10 = 90 \Rightarrow CX = 100 + 10 = 110$
 $\therefore CX - XC = 110 - 90 = 20 = XX$
- (d) $XXIII = 23 \Rightarrow XXVII = 27$
 $\therefore XXVII - XXIII = 27 - 23 = 4 = IV$
- (e) $CC = 100 + 100 = 200 \Rightarrow VI = 6$
 $\therefore CC \times VI = 200 \times 6 = 1200 = MCC$
- (f) $LXI = 50 + 11 = 61 \Rightarrow XVII = 17$
 $\therefore LXI \times XVII = 61 \times 17 = 1037 = MXXXVII$

$$(g) \text{ CCL} = 100 + 100 + 50 = 250 \Rightarrow \text{XXV} = 25$$

$$\therefore \text{CCL} + \text{XXV} = 250 + 25 = 275 = \text{CCLXXV}$$

$$(h) \text{ MMM} = 1000 + 1000 + 1000 = 3000, \text{L} = 50$$

$$\therefore \text{MMM} + \text{L} = 3000 + 50 = 3050 = \text{MMMVL}$$

$$11. (a) 1497 = 1000 + 400 + (100 - 10) + 7$$

$$= \text{M} + \text{CD} + \text{XC} + \text{VII}$$

$$= \text{MCDXCVII}$$

$$(b) 1556 = 1000 + 500 + 50 + 6$$

$$= \text{M} + \text{D} + \text{L} + \text{VI} = \text{MDLVI}$$

$$(c) 1853 = 1000 + 800 + 50 + 3$$

$$= \text{M} + \text{D} + \text{CCC} + \text{L} + \text{III} = \text{MDCCCLIII}$$

$$(d) 1947 = 1000 + 900 + 40 + 7$$

$$= \text{M} + \text{CM} + \text{XL} + \text{VII} = \text{MCMXLVII}$$

Check Yourself

- (a) Repetition of a Roman Symbol means **addition**.

(b) If a smaller symbol is placed to the left of a bigger symbol then their values are **subtracted**.

(c) The symbol **I** is never written to the left of L, C and D.

(d) The symbols L and D are never **subtracted**.

(e) The symbol **never** can be added to or subtracted from L and C, only.
- (a) True (b) False (c) True (d) True
- (a) $\text{XCVII} - \text{XL} = 97 - 40 = 57$, (a) \rightarrow (ii)

(b) $\text{L} + \text{D} = 50 + 500 = 550$, (b) \rightarrow (v)

(c) $\text{LXXXIII} + \text{XII} = 50 + 30 + 3 + 12 = 95$, (c) \rightarrow (iv)

(d) $\text{M} - \text{D} = 1000 - 500 = 500$, (d) \rightarrow (i)

(e) $\text{DCCXCIX} + \text{V} = 500 + 100 + 100 + 90 + 9 + 5 = 804$ (e) \rightarrow (iii)
- (a) (ii) **XXVII** (b) (ii) 150

(c) (iii) **XLI** (d) (iv) 10

(e) (iv) **M**

5. Operations on Large Numbers

Exercise 5.1

1. (a) 2140728

$$\begin{array}{r} 2140728 \\ + 1358459 \\ \hline \end{array}$$

$$\begin{array}{r} 3499187 \\ \hline \end{array}$$

(c) 46242038

$$\begin{array}{r} 46242038 \\ + 11078834 \\ \hline \end{array}$$

$$\begin{array}{r} 57320872 \\ \hline \end{array}$$

2. (a) 15582997

$$\begin{array}{r} 15582997 \\ 3258467 \\ \hline \end{array}$$

$$\begin{array}{r} + 9827122 \\ \hline \end{array}$$

$$\begin{array}{r} 28668586 \\ \hline \end{array}$$

(c) 36736171

$$\begin{array}{r} 36736171 \\ 10789938 \\ \hline \end{array}$$

$$\begin{array}{r} + 25113108 \\ \hline \end{array}$$

$$\begin{array}{r} 72639217 \\ \hline \end{array}$$

(b) 7453619

$$\begin{array}{r} 7453619 \\ + 1876984 \\ \hline \end{array}$$

$$\begin{array}{r} 9330603 \\ \hline \end{array}$$

(d) 33268974

$$\begin{array}{r} 33268974 \\ + 5794347 \\ \hline \end{array}$$

$$\begin{array}{r} 39063321 \\ \hline \end{array}$$

(b) 25881418

$$\begin{array}{r} 25881418 \\ 1258454 \\ \hline \end{array}$$

$$\begin{array}{r} + 32584483 \\ \hline \end{array}$$

$$\begin{array}{r} 59724355 \\ \hline \end{array}$$

(d) 56131708

$$\begin{array}{r} 56131708 \\ 7135118 \\ \hline \end{array}$$

$$\begin{array}{r} + 30631693 \\ \hline \end{array}$$

$$\begin{array}{r} 93898519 \\ \hline \end{array}$$

Exercise 5.2

1. (a) 5234156

$$\begin{array}{r} 5234156 \\ - 1393169 \\ \hline \end{array}$$

$$\begin{array}{r} 3840987 \\ \hline \end{array}$$

(c) 13228005

$$\begin{array}{r} 13228005 \\ - 4635412 \\ \hline \end{array}$$

$$\begin{array}{r} 8592593 \\ \hline \end{array}$$

(b) 39487315

$$\begin{array}{r} 39487315 \\ - 20397852 \\ \hline \end{array}$$

$$\begin{array}{r} 19089463 \\ \hline \end{array}$$

(d) 23618815

$$\begin{array}{r} 23618815 \\ - 11569609 \\ \hline \end{array}$$

$$\begin{array}{r} 12049206 \\ \hline \end{array}$$

2. (a) $59965656 - 21207704 - 19844921$

$$\begin{array}{r} 59965656 \\ - 21207704 \\ \hline \end{array}$$

$$\begin{array}{r} + 19844921 \\ \hline \end{array}$$

$$\begin{array}{r} 41052625 \\ \hline \end{array}$$

$$\begin{array}{r} 59965656 \\ - 41052625 \\ \hline \end{array}$$

$$\begin{array}{r} - 41052625 \\ \hline \end{array}$$

$$\begin{array}{r} 18913031 \\ \hline \end{array}$$

$$(b) \quad 80909989 - 40325172 - 22207004$$

$$\begin{array}{r} 40325172 \\ + 22207004 \\ \hline 62532176 \end{array} \qquad \begin{array}{r} 80909989 \\ - 62532176 \\ \hline 18377813 \end{array}$$

$$(c) \quad 28316842 - 14965067 - 2315750$$

$$\begin{array}{r} 14965067 \\ + 2315750 \\ \hline 17280817 \end{array} \qquad \begin{array}{r} 28316842 \\ - 17280817 \\ \hline 11036025 \end{array}$$

$$(d) \quad 96596596 - 5432107 - 12340087$$

$$\begin{array}{r} 12340087 \\ + 5432107 \\ \hline 17772194 \end{array} \qquad \begin{array}{r} 96596596 \\ - 17772194 \\ \hline 78824402 \end{array}$$

$$3. \quad (a) \quad 9000000$$

$$\begin{array}{r} - 6253102 \\ \hline 2746898 \end{array}$$

$$(b) \quad 57089489$$

$$\begin{array}{r} - 9821546 \\ \hline 47267943 \end{array}$$

$$(c) \quad 800241623$$

$$\begin{array}{r} - 724681974 \\ \hline 75559649 \end{array}$$

$$(d) \quad 410235564$$

$$\begin{array}{r} - 38956748 \\ \hline 371278816 \end{array}$$

Exercise 5.3

$$1. \quad 92409540$$

$$\begin{array}{r} 76585372 \\ + 37849075 \\ \hline 206843987 \end{array}$$

(Total population of the state)

$$2. \quad \text{Sumita earns per year} = ₹ 545920$$

Sumita earns more = 58723

Saurabh's salary per year = 545920

$$\begin{array}{r} - 58723 \\ \hline ₹ 487197 \end{array}$$

3. Samika spent time on her project = 2,59,200 seconds

Total time given to her = 3,60,000 seconds

$$\begin{array}{r} \therefore \quad \quad \quad 3,60,000 \\ \quad \quad \quad \quad - 259200 \\ \hline \end{array}$$

Time she have 100800 seconds

4. A dam pumped gallons of water in may = 1,42,39,053

In June it pumped = 80,46,190

$$\begin{array}{r} 14239053 \\ + 8046190 \\ \hline 22285243 \end{array}$$

5. ABC airlines requires a pilot to flying experience before promotion = 4,00,000 hours

Vinayak have complete experience to flying = 3,46,928

He need to qualify for promotion = 400000

$$\begin{array}{r} - 346928 \\ \hline 53072 \end{array}$$

6. A got votes = 2395710

B got votes = 321001

Total votes of A and B = 2395710

Votes of C = 7595394

$$\begin{array}{r} + 321001 \\ \hline 2716711 \end{array}$$

$$\begin{array}{r} - 2716711 \\ \hline 4878683 \text{ Votes} \end{array}$$

\therefore C won the election.

7. Number of books in junior library = 48473

Number of books in senior library = 73602

Total number of books in both library,

$$\begin{array}{r} 48473 \\ + 73602 \\ \hline 122075 \end{array}$$

Difference = 73602

$$\begin{array}{r} - 48473 \\ \hline 25129 \end{array}$$

8. The sum of two numbers = 684751923

One number = 398460025

∴ Other number = 684751923

$$\begin{array}{r} - 398460025 \\ \hline \end{array}$$

$$\begin{array}{r} 286291898 \\ \hline \end{array}$$

Exercise 5.4

1. (a) $64 \times 13 = 64 \times (10 + 3) = 64 \times 10 + 64 \times 3 = 640 + 192 = 832$

(b) $81 \times 15 = (80 + 1) \times 15 = 80 \times 15 + 1 \times 15 = 1200 + 15 = 1215$

(c) $321 \times 16 = 321 \times (10 + 6) = 321 \times 10 + 321 \times 6$

$$= 3210 + 1926 = 5136$$

(d) $259 \times 17 = 259 \times (10 + 7) = 259 \times 10 + 259 \times 7$

$$= 2590 + 1813 = 4403$$

2. (a) $966 \times 38 = (1000 - 34) \times 38 = 1000 \times 38 - 34 \times 38$

$$= 38000 - 1292 = 36708$$

(b) $4258 \times 369 = (4000 + 258) \times 369 = 1476000 + 95202 = 1571202$

(c) $6492 \times 222 = (6500 - 8) \times 222 = 6500 \times 222 - 222 \times 8$

$$= 14,43,000 - 1776 = 1441224$$

(d) $5009 \times 1837 = (5000 + 9) \times 1837 = 5000 \times 1837 + 9 \times 1837$

$$= 9185000 + 16533 = 9201533$$

Exercise 5.5

1. (a) $92 \overline{) 80647} (876$

$$\begin{array}{r} -736 \\ \hline \end{array}$$

$$704$$

$$\begin{array}{r} -644 \\ \hline \end{array}$$

$$607$$

$$\begin{array}{r} -552 \\ \hline \end{array}$$

$$\begin{array}{r} 55 \\ \hline \end{array}$$

$$Q = 876$$

$$R = 55$$

(b) $34 \overline{) 9979684} (293520$

$$\begin{array}{r} -68 \\ \hline \end{array}$$

$$317$$

$$\begin{array}{r} -306 \\ \hline \end{array}$$

$$119$$

$$\begin{array}{r} -102 \\ \hline \end{array}$$

$$176$$

$$\begin{array}{r} -170 \\ \hline \end{array}$$

$$68$$

$$\begin{array}{r} -68 \\ \hline \end{array}$$

$$\begin{array}{r} 4 \\ \hline \end{array}$$

$$Q = 293520$$

$$R = 4$$

$$\begin{array}{r}
 \text{(c) } 214 \overline{) 371265} \quad (1734 \\
 \underline{-214} \\
 1572 \\
 \underline{-1498} \quad Q = 1734 \\
 746 \quad R = 189 \\
 \underline{-642} \\
 1045 \\
 \underline{-856} \\
 189
 \end{array}$$

$$\begin{array}{r}
 \text{(d) } 342 \overline{) 864921} \quad (2529 \\
 \underline{-684} \\
 1809 \\
 \underline{-1710} \quad Q = 2529 \\
 992 \quad R = 3 \\
 \underline{-684} \\
 3081 \\
 \underline{-3078} \\
 3
 \end{array}$$

2. (a) $24516\emptyset \div 4\emptyset$

$$\begin{array}{r}
 4 \overline{) 24516} \quad (6129 \\
 \underline{-24} \\
 5 \\
 \underline{-4} \quad Q = 6129 \\
 11 \\
 \underline{-8} \\
 36 \\
 \underline{-36} \\
 0
 \end{array}$$

(b) $7891360\emptyset \div 9\emptyset$

$$\begin{array}{r}
 9 \overline{) 7891360} \quad (876817 \\
 \underline{-720} \\
 691 \\
 \underline{-630} \quad Q = 876817 \\
 613 \quad R = 7 \\
 \underline{-540} \\
 736 \\
 \underline{-720} \\
 160 \\
 \underline{-90} \\
 70 \\
 \underline{-63} \\
 7
 \end{array}$$

(c) $465332\emptyset \div 50\emptyset$

$$\begin{array}{r}
 500 \overline{) 4653320} \quad (9306 \\
 \underline{-4500} \\
 1533 \\
 \underline{-1500} \quad Q = 9306 \\
 3320 \quad R = 320 \\
 \underline{-300} \\
 320
 \end{array}$$

(d) $2247970\emptyset \div 80\emptyset$

$$\begin{array}{r}
 800 \overline{) 22479700} \quad (27099 \\
 \underline{-1600} \\
 6479 \\
 \underline{-6400} \quad Q = 28099 \\
 7970 \quad R = 500 \\
 \underline{-7200} \\
 7700 \\
 \underline{-7200} \\
 500
 \end{array}$$

3. (a) $35249 \div 10 \Rightarrow Q = 3524, R = 9$

(b) $1153679 \div 100 \Rightarrow Q = 11536, R = 79$

(c) $2401389 \div 1000 \Rightarrow Q = 2401, R = 389$

Exercise 5.6

1. A box has chocolates = 48

Total boxes = 78265

Total chocolates in boxes = 78265

$$\begin{array}{r} \times 48 \\ \hline 3756720 \end{array}$$

2. A truck carry mangoes box = 82

Total number of trucks = 39,025

∴ Number of trucks can carry mangoes of box = 39025

$$\begin{array}{r} \times 82 \\ \hline 3200050 \end{array}$$

3. The product of two numbers = 398652

One number = 1434

The other number = $\frac{398652}{1434} = 278$

4. A factory manufactures Jeans in a day = 350

Jeans manufacture in a year = $365 \times 350 = 127750$

5. Sanjeev earns rupees in a day = ₹ 1756

He earn total money in 2 years = ₹ $1756 \times 730 = ₹ 128180$

6. 23,520 sweets packed equally in 96 boxes

Sweets packed in each box = $\frac{23520}{96} = 245$

7. Bags of rice = 3,87,255

Total trucks = 165

Number of bags loaded in 1 truck = $\frac{387255}{165} = 2347$

Number of bags of rice loaded in 407 trucks

$$= 2347 \times 407 = 955229$$

8. Here, the number = $\frac{173040062}{4082} = 42391$

Exercise 5.7

1. (a) $18 \times 3 + 30 \div 5 - 17 = 54 + 6 - 17 = 60 - 17 = 43$
(b) $16 + (3 \times 8) - 15 + 18 \div 9 - 15$
 $= 16 + 24 - 15 + 2 - 15$
 $= 42 - 30 = 12$
(c) $35 \times (3 + \overline{64 \div 8}) - 3 = 35 \times (3 + 8) - 3$
 $= 35(11) - 3 = 385 - 3 = 382$
(d) $50 \times 6 - [(30 \div \overline{5 \times 3}) \times 7] + 2$
 $= 300 - [(30 \div 15) \times 7] + 2 = 300 - [2 \times 7] + 2$
 $= 300 - 14 + 2 = 302 - 14 = 288$
2. (a) $14 \boxed{\times} 6 - 7 = 77$ (b) $3 \boxed{\times} 6 \boxed{-} 9 = 9$
(c) $4 \boxed{+} 5 \boxed{-} 2 = 7$ (d) $6 \boxed{\times} 8 \boxed{+} 12 = 60$

Check Yourself

1. (a) $52869540 + 1 = 52869540$
(b) $3896807 \times 10 = 38968070$
(c) $634800 \div 100 = 6348$
(d) $31654 \times 2156 = 2156 \times 31654$
2. (a) False (b) True (c) False (d) True
3. (a) \rightarrow (v), (b) \rightarrow (iv), (c) \rightarrow (ii), (d) \rightarrow (iii), (e) \rightarrow (i)
4. (a) (ii) 12,00,000 (b) (iii) 6,67,334
(c) (iv) 7,50,75,075 (d) (iv) 0

6. Factors and Multiples

1. (a) The first five multiples of 6 are 6, 12, 18, 24, 30.
(b) The first five multiples of 11 are 11, 22, 33, 44, 55.
(c) The first five multiples of 19 are 19, 38, 57, 76, 95.
(d) The first five multiples of 21 are 21, 42, 63, 84, 105.
2. (a) The factors of $18 = 1, 2, 3, 6, 9, 18$
(b) The factors of $28 = 1, 2, 4, 7, 14, 28$
(c) The factors of $32 = 1, 2, 4, 8, 16, 32$
(d) The factors of $45 = 1, 3, 5, 9, 15, 45$

- 3.** The numbers ending with 0, 2, 4, 6, 8 (976, 670, 5694) are divisible by 2.
i.e. (a), (b), (d).
- 4.** The number are divisible by 3 if the sum of its digits is divisible by 3.
(a) Sum of its digits = $(8 + 3 + 7) = 18$, which is divisible by 3.
(b) Sum of its digits = $(1 + 4 + 9 + 3) = 17$, which is not divisible by 3.
(c) Sum of its digit = $(2 + 6 + 4 + 1 + 2) = 15$, which is divisible by 3.
(d) Sum of its digits = $(3 + 7 + 4 + 0 + 1) = 15$, which is divisible by 3.
i.e. (a), (c), (d), is divisible by 3.
- 5.** A number is divisible by 4 if the number formed by its last two digits on its extreme right is divisible by 4.
(a) The number formed by its last two digits is 94, which is not divisible by 4.
 \therefore 894 is not divisible by 4.
(b) The number formed by its last two digits is 56, which is divisible by 4.
 \therefore 1056 is divisible by 4.
(c) The number formed by its last two digits is 60, which is divisible by 4.
 \therefore 2360 is divisible by 4.
(d) The number formed by its last two digits is 30, which is not divisible by 4.
 \therefore 7130 is not divisible by 4.
 \therefore (b), (c) is divisible by 4.
- 6.** A number is divisible by 5 if its unit digit is 0 or 5. The numbers which has its unit digit 0, 5 are 1980, 1785, 27905 i.e. (a), (b), (c) are divisible by 5.
- 7.** A number is divisible by 6 if it is divisible by each one of 2 and 3.
(a) Now, consider the number 3132.
Its unit digit is 2. So, it is divisible by 2.
Sum of its digits = $(3 + 1 + 3 + 2) = 9$, which is divisible by 3.
So, the given number is divisible by 3.
Thus, it is divisible by each one 2 and 3.
Hence, 3132 is divisible by 6.

- (b) Now, consider the number 5704.
Its unit digit is 4, So, it is divisible by 2.
Sum of its digits $= (5 + 7 + 0 + 4) = 16$, which is not divisible by 3.
So, the given number is not divisible by 3.
Hence, 5704 is not divisible by 6.
- (c) Now, consider the number 8316.
Its unit digit is 6, so, it is divisible by 2.
Sum of its digits $= (8 + 3 + 1 + 6) = 18$, which is divisible by 3.
Thus, it is divisible by each one 2 and 3.
Hence, 8316 is divisible by 6.
- (d) Now, consider the number 9430.
Its unit digit is 0 which is divisible by 2.
Sum of its digits $= (9 + 4 + 3 + 0) = 16$, which is not divisible by 3.
i.e. (a), (c) hence, 9430 is not divisible by 6.

8. Here, double the digit at ones place. Find the difference between the number obtained in step 1 and the number formed by rest of its digits. If the number so obtained is divisible by 7, then the given number is divisible by 7.

- (a) Consider the number 252,
Now, $25 - (2 \times 2) = (25 - 4) = 21$, which is divisible by 7.
So, 252, is divisible by 7.
- (b) Consider the number 1204,
Now, $120 - (2 \times 4) = 120 - 8 = 112$, which is divisible by 7.
So, 1204 is divisible by 7.
- (c) Consider the number 5843,
Now, $584 - (3 \times 2) = 584 - 6 = 578$, which is not divisible by 7.
So, 5843 is not divisible by 7.
- (d) Consider the number 8036,
Now, $803 - (6 \times 2) = 803 - 12 = 791$, which is divisible by 7.
i.e. (a), (b), (c) one divisible by 7.

9. A number is divisible by 8, if the number formed by its last 3 digits on its extreme right is divisible by 8.
- (a) Consider the number 1372,
The number formed by its last three digits is 372, which is not divisible by 8.
 \therefore 1372 is not divisible by 8.
- (b) Consider the number 10568
The number formed by its last three digits is 568, which is divisible by 8.
 \therefore 10568 is divisible by 8.
- (c) Consider the number 62156.
The number formed by its last three digits is 156, which is not divisible by 8.
 \therefore 62156 is not divisible by 8.
- (d) Consider the number 50432.
The number formed by its last three digit is 432, which is divisible by 8.
 \therefore 50432 is divisible by 8.
i.e. (b, d) is divisible by 8.
10. A number is divisible by 9 if the sum of its digits is divisible by 9.
- (a) Consider the number 8316.
(Sum of its digits) = $(8 + 3 + 1 + 6) = 18$, which is divisible by 9.
 \therefore So, 8316 is divisible by 9.
- (b) Consider the number 7509.
Sum of its digits = $(7 + 5 + 0 + 9) = 21$, which is not divisible by 9.
 \therefore So, 7509 is not divisible by 9.
- (c) Consider the number 4186.
Sum of its digit = $(4 + 1 + 8 + 6) = 19$, which is not divisible by 9.
 \therefore So, 4186 is not divisible by 9.
- (d) Consider the number 26901.
Sum of its digit = $(2 + 6 + 9 + 0 + 1) = 18$, which is divisible by 9.
 \therefore So, 26901 is divisible by 9.
i.e. (a), (d) is divisible by 9.

11. A number is divisible by 10 only when its unit digit is 0.
(b), (c) is divisible by 10.
12. A number is divisible by 11 if the difference between the sum of digits at odd places and the sum of digits at even places is either 0 or a multiple of 11.
- (a) Consider the number 2101,
Sum of its digits at odd place = $(1 + 1) = 2$
Sum, of its digits at even place = $(0 + 2) = 2$
Their difference = $(2 - 2) = 0$, which is divisible by 11.
 \therefore 2101 is divisible by 11.
- (b) Consider the number 32571,
Sum of its digits at odd places = $(1 + 5 + 3) = 9$
Sum of its digits at even places = $(7 + 2) = 9$
Their difference = $(9 - 9) = 0$, which is divisible by 11.
 \therefore 32571 is divisible by 11.
- (c) Consider the number 35064,
Sum of its digits at odd places = $(4 + 0 + 3) = 7$
Sum of its digits at even places = $(6 + 5) = 11$
Their difference $11 - 7 = 4$, which not divisible by 11.
 \therefore 35064 is divisible by 11.
- (d) Consider the number 20833.
Sum of its digits at odd places = $(3 + 8 + 2) = 13$
Sum of its digits at even places = $(3 + 0) = 3$
Their difference = $(13 - 3) = 10$, which is not divisible by 11.
i.e. (a), (b) is divisible by 11.
13. If a number has only two factors 1 and itself, then the number is said to be a prime number.
So, 11, 67, 19, 83, 89 are prime numbers.
14. A number that has more than two factors is called a composite number. The composite numbers are 51, 87, 81, 78, 93.

Check Yourself

1. (a) (11, 13) is **co-prime** primes.
(b) 1 is neither prime nor composite number.

- (c) A number is divisible by 3 if the sum of its digits is divisible by 3.
- (d) If any two numbers have no common factor other than one is called **co-prime**.
- (e) A number is divisible by 2 if its ones digit is 0, 2, 4, 6 or 8.
2. (a) True (b) True (c) True (d) True (e) True
3. (a) → (iii) (b) → (i) (c) → (iv) (d) → (ii)
4. (a) (i) itself (b) (ii) composite numbers
 (c) (ii) 3 and 5 (d) (i) 11
 (e) (iii) 5

7. Highest Common Factor and Lowest Common Multiple

Exercise 7.1

1. (a) Given numbers are 24 and 33.

First factorise them :

$$24 = 2 \times 2 \times 2 \times 3$$

$$33 = 3 \times 11$$

The common factors of 24 and 33 is 3.

Hence, the HCF of 24 and 33 = 3.

2	24
2	12
2	6
3	3
	1

3	33
11	11
	1

- (b) Given numbers are 36 and 252 First factorise them:

2	36
2	19
3	9
3	3
	1

2	252
2	126
3	63
21	21
	1

$$36 = 2 \times 2 \times 3 \times 3$$

$$252 = 2 \times 2 \times 3 \times 21$$

The common factors of 36 and 252 are 2, 2, 3.

Hence, HCF of 36 and 252 = $2 \times 2 \times 3 = 12$.

- (c) Given numbers are 18, 36, 45.

First factorise them,

2	18
3	9
3	3
	1

2	36
2	18
3	9
3	3
	1

3	45
3	15
5	5
	1

The common factor of 18, 36 and 45 = 3

Hence, HCF of 18, 36 and 45 = 3.

- (d) Given numbers are 45, 25 and 65.

First factorise them,

3	45
3	15
5	5
	1

5	25
5	5
	1

5	65
13	5
	1

$$45 = 3 \times 3 \times 5$$

$$25 = 5 \times 5$$

$$65 = 5 \times 13$$

The common factor of 45, 25 and 65 is 5.

Hence, HCF of 45, 25 and 65 is 5.

- (e) Given number are 90, 140 and 210.

First factorise them :

2	90
3	45
3	15
5	5
	1

2	140
2	70
5	35
7	7
	1

2	210
3	105
5	35
7	7
	1

$$90 = 2 \times 3 \times 3 \times 5 \quad 140 = 2 \times 2 \times 5 \times 7 \quad 210 = 2 \times 3 \times 5 \times 7$$

The common factors of 90, 140 and 210 are 2×5 .

Hence, HCF of 90, 140, and 210 = $2 \times 5 = 10$

- (f) Given numbers are 38, 94 and 130.

First factorise them :

2	38
19	19
	1

2	94
47	47
	1

2	130
5	65
13	13
	1

$$38 = 2 \times 19$$

$$94 = 2 \times 47$$

$$130 = 2 \times 5 \times 13$$

The common factor of 38, 94 and 130 is 2.

Hence, the HCF of 38, 94 and 130 = 2.

2. (a) Given numbers of 42 and 84.

First factorise them :

$$42 = 2 \times 3 \times 7$$

$$84 = 2 \times 2 \times 3 \times 7$$

The common factors of 42, 84 are $2 \times 3 \times 7$.

Hence, the HCF of 42 and 84

$$= 2 \times 3 \times 7 = 42$$

2	42
3	21
7	7
	1

2	84
2	42
3	21
7	7
	1

- (b) Given numbers of 36 and 63.

First factorise them :

$$36 = 2 \times 2 \times 3 \times 3$$

$$63 = 3 \times 3 \times 7$$

The common factors of 36 and 63 are 3×3 .

Hence, the HCF of 36 and 63

$$= 3 \times 3 = 9$$

2	36
2	18
3	9
3	3
	1

3	63
3	21
7	7
	1

- (c) Given numbers are 25 and 90.

First factorise them :

$$25 = 5 \times 5$$

$$90 = 2 \times 3 \times 3 \times 5$$

The common factor of 25 and 90 is 5.

Hence, the HCF of 25 and 90 = 5.

5	25
5	5
	1

2	90
3	45
3	15
5	5
	1

- (d) Given numbers are 12, 18 and 27.

First factorise them :

2	12	2	18	3	27
2	6	3	9	3	9
3	3	3	3	3	3
	1		1		1

$$12 = 2 \times 2 \times 3 \quad 18 = 2 \times 3 \times 3 \quad 27 = 3 \times 3 \times 3$$

The common factors of 12, 18 and 27 are 3×3 .

Hence, the HCF of 12, 18 and 27 = $3 \times 3 = 9$

- (e) Given numbers are 18, 24 and 32.

First factorise them :

2	18	2	24	2	32
3	9	2	12	2	16
3	3	2	6	2	8
	1	3	3	2	4
			1	2	2
					1

$$18 = 2 \times 3 \times 3 \quad 24 = 2 \times 2 \times 2 \times 3 \quad 32 = 2 \times 2 \times 2 \times 2 \times 2$$

The common factors of 18, 24 and 32 are 2×3 .

Hence, the HCF of 18, 24 and 32 = $2 \times 3 = 6$.

- (f) Given numbers are 22, 66 and 121.

First factorise them :

2	22	2	66	11	121
11	11	3	33	11	11
	1	11	11		1
			1		

$$22 = 2 \times 11 \quad 66 = 2 \times 3 \times 11 \quad 121 = 11 \times 11$$

\therefore The common factors of 22, 66 and 121 is 11.

Hence, the HCF of 22, 66 and 121 = 11

3. (a) The smallest number is 12.

So, divide 28 by 12.

∴ The last divisor is 4.

$$\begin{array}{r} 12 \overline{) 28} \quad (2 \\ \underline{-24} \\ 4 \overline{) 12} \quad (3 \\ \underline{-12} \\ \times \end{array}$$

∴ 4 is the HCF of 12 and 28.

- (b) The smallest number is 42. So, divide 330 by 42.

$$\begin{array}{r} 42 \overline{) 330} \quad (7 \\ \underline{-294} \\ 36 \overline{) 42} \quad (1 \\ \underline{-36} \\ 6 \overline{) 36} \quad (6 \\ \underline{-36} \\ \times \end{array}$$

∴ The last divisor is 6.

∴ 6 is the HCF of 42 and 330.

- (c) The smallest number is 78. So, divide 210 by 78.

$$\begin{array}{r} 78 \overline{) 210} \quad (2 \\ \underline{-156} \\ 54 \overline{) 78} \quad (1 \\ \underline{-54} \\ 24 \overline{) 54} \quad (2 \\ \underline{-48} \\ 6 \overline{) 24} \quad (4 \\ \underline{-24} \\ \times \end{array}$$

∴ The last divisor is 6.

∴ 6 is the HCF of 78 and 210.

- (d) First, find the HCF of any two of the three numbers, say 60 and 420.

$$\begin{array}{r} 60 \overline{) 420} \quad (7 \\ \underline{-420} \\ 0 \end{array}$$

The last divisor is 60.

i.e. the HCF of 60 and 420 is 60.

Now, find the HCF of 924 and 60.

$$\begin{array}{r} 60 \overline{) 924} \quad (15 \\ \underline{-900} \\ 24 \overline{) 60} \quad (2 \\ \underline{-48} \\ 12 \overline{) 24} \quad (2 \\ \underline{-24} \\ \times \end{array}$$

∴ The last divisor is 12.

∴ The HCF of 60, 420 and 924 is 12.

- (e) First, find the HCF of any two of the three numbers, say 154 and 770.

The last divisor is 154

i.e. the HCF of 154 and 770 is 154.

$$\begin{array}{r} 154 \overline{) 770} \quad (5 \\ \underline{-770} \\ \times \end{array}$$

Now, find the HCF of 910 and 154.

$$\begin{array}{r} 154 \overline{) 910} \quad (5 \\ \underline{-770} \\ 140 \overline{) 154} \quad (1 \\ \underline{-140} \\ 14 \overline{) 140} \quad (10 \\ \underline{-140} \\ \times \end{array}$$

∴ The last divisor is 14.

∴ The HCF of 154, 770 and 920 is 14.

- (f) First, find the HCF of any two of the three numbers, say 210 and 420.

The last divisor is 210.

i.e. the HCF of 210 and 420 is 210.

$$\begin{array}{r} 210 \overline{) 420} \quad (2 \\ \underline{-420} \\ \times \end{array}$$

Now, find the HCF of 540 and 210.

$$\begin{array}{r}
 210 \overline{) 540} \quad (2 \\
 \underline{-420} \\
 120 \overline{) 210} \quad (1 \\
 \underline{-120} \\
 90 \overline{) 120} \quad (1 \\
 \underline{-90} \\
 30 \overline{) 90} \quad (3 \\
 \underline{-90} \\
 \hline
 \times
 \end{array}$$

\therefore The divisor is 30.

\therefore The HCF of 210, 420 and 540 is 30.

Exercise 7.2

1. (a) The LCM of 30 and 75.

2	30, 75
3	15, 75
5	5, 25
5	1, 5
	1, 1

$$\begin{aligned}
 \therefore \text{LCM of 30 and 75} \\
 = 2 \times 3 \times 5 \times 5 = 150
 \end{aligned}$$

(b) The LCM of 45 and 66.

2	45, 66
3	45, 33
3	15, 11
5	5, 11
11	1, 11
	1, 1

$$\begin{aligned}
 \therefore \text{LCM} = 2 \times 3 \times 3 \times 5 \times 11 \\
 = 990
 \end{aligned}$$

(c) The LCM of 20, 25 and 60.

2	20, 25, 60
2	10, 25, 30
3	5, 25, 15
5	5, 25, 5
5	1, 5, 1
	1, 1, 1

$$\begin{aligned}
 \therefore \text{LCM} = 2 \times 2 \times 3 \times 5 \times 5 \\
 = 300
 \end{aligned}$$

(d) The LCM of 36, 33 and 81.

2	36, 33, 81
2	18, 33, 81
3	9, 33, 81
3	3, 11, 27
3	1, 11, 9
3	1, 11, 3
11	1, 11, 1
	1, 1, 1

$$\begin{aligned}
 \therefore \text{LCM} = 2 \times 2 \times 3 \times 3 \times 3 \times 3 \times 11 \\
 = 3564
 \end{aligned}$$

2. (a) 28 and 35

2	28, 35
2	14, 35
5	7, 35
7	7, 7
	1, 1

The LCM of 28 and 35

$$= 2 \times 2 \times 5 \times 7 = 140$$

(b) 48 and 72

2	48, 72
2	24, 36
2	12, 18
2	6, 9
3	3, 9
3	1, 3
	1, 1

The LCM of 48 and 72

$$= 2 \times 2 \times 2 \times 2 \times 3 \times 3 = 144$$

(c) 22 and 66

2	22, 66
3	11, 33
11	11, 11
	1, 1

The LCM of 22 and 66

$$= 2 \times 3 \times 11 = 66$$

(d) 36, 48 and 96

2	36, 48, 96
2	18, 24, 48
2	9, 12, 24
2	9, 6, 12
2	9, 3, 6
3	9, 3, 3
3	3, 1, 1
	1, 1, 1

The LCM of 36, 48 and 96

$$= 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 = 288$$

(e) 125, 180 and 210.

2	125, 180, 210
2	125, 90, 105
3	125, 45, 105
3	125, 15, 35
5	125, 5, 35
5	25, 1, 7
5	5, 1, 7
7	1, 1, 7
	1, 1, 1

(f) 198, 216 and 360.

2	198, 216, 360
2	99, 108, 120
2	99, 54, 60
2	99, 27, 30
3	99, 27, 15
3	33, 9, 5
3	11, 3, 5
5	11, 1, 5
11	11, 1, 1
	1, 1, 1

$$\begin{aligned} \therefore \text{The LCM of 125, 180 and 120} &= 2 \times 2 \times 3 \times 3 \times 5 \times 5 \times 5 \times 7 \\ &= 31500 \\ \text{The LCM of 198, 216 and 360} &= 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 5 \times 11 \\ &= 23760 \end{aligned}$$

3. (a) Here, the division of the given numbers by their common factor is a too long process. So, we will use another method.

$$\begin{array}{r} 20 \overline{) 35} \quad (1 \\ \underline{-20} \\ 15 \end{array} \quad \begin{array}{r} 15 \overline{) 20} \quad (1 \\ \underline{-15} \\ 5 \end{array} \quad \begin{array}{r} 5 \overline{) 15} \quad (3 \\ \underline{-15} \\ \times \end{array}$$

Now, divide 45 by 5.

$$\therefore \text{HCF} = 5$$

2	20,	35,	45
2	10,	35,	45
3	5,	35,	45
3	5,	35,	15
5	5,	35,	5
7	1,	7,	1
	1,	1,	1

$$\begin{array}{r} 5 \overline{) 45} \quad (9 \\ \underline{-45} \\ \times \end{array}$$

$$\therefore \text{The LCM of 20, 35 and 45} = 2 \times 2 \times 5 \times 7 \times 9 = 1260$$

- (b) Here, division of the given numbers by their common factor is a too long process.

So, we will use another method.

Find the HCF of these numbers by division method.

$$\begin{array}{r} 10 \overline{) 25} \quad (2 \\ \underline{-20} \\ 5 \end{array} \quad \begin{array}{r} 5 \overline{) 10} \quad (2 \\ \underline{-10} \\ \times \end{array}$$

Now, divide 65 by 5.

$$\therefore \begin{array}{r} 5 \overline{) 65} \quad (13 \\ \underline{-65} \\ \times \end{array}$$

∴ HCF = 5

2	10, 25, 65
5	5, 25, 65
5	1, 5, 13
13	1, 1, 13
	1, 1, 1

∴ The LCM of 10, 25, 65 = $2 \times 5 \times 5 \times 13 = 650$

$$\begin{array}{r} \text{(c) } 27 \overline{) 45} \text{ (1} \\ \underline{-27} \\ 18 \overline{) 27} \text{ (1} \\ \underline{-18} \\ 9 \overline{) 18} \text{ (2} \\ \underline{-18} \\ 0 \end{array}$$

$$\begin{array}{r} 9 \overline{) 60} \text{ (6} \\ \underline{-54} \\ 6 \overline{) 9} \text{ (1} \\ \underline{-6} \\ 3 \overline{) 6} \text{ (2} \\ \underline{-6} \\ 0 \end{array}$$

$$\begin{array}{r} 3 \overline{) 72} \text{ (24} \\ \underline{-72} \\ \times \end{array}$$

$$\begin{array}{r} 3 \overline{) 96} \text{ (32} \\ \underline{9} \\ 6 \\ \underline{6} \\ \times \end{array}$$

∴ HCF = 3

For finding LCM of 24, 45, 60, 72, and 96

$$= 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 5 = 4320$$

2	27, 45, 60, 72, 96
2	27, 45, 30, 36, 48
2	27, 45, 15, 18, 24
2	27, 45, 15, 9, 12
2	27, 45, 15, 9, 6
3	27, 45, 15, 9, 3
3	9, 15, 5, 3, 1
3	3, 5, 5, 1, 1
5	1, 5, 5, 1, 1
	1, 1, 1, 1, 1

(d) Here, 36, 64, 72, 96 and 120.

2	36, 64, 72, 96, 120
2	18, 32, 36, 48, 60
2	9, 16, 18, 24, 30
2	9, 8, 9, 12, 15
2	9, 4, 9, 6, 15
2	9, 2, 9, 3, 15
3	9, 1, 9, 3, 15
3	3, 1, 3, 1, 5
5	1, 1, 1, 1, 5
	1, 1, 1, 1, 1

The LCM of 135 = $2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 5 = 2880$

(e) Here, 42, 60, 84 and 108.

$$\begin{array}{r}
 42 \overline{) 60} (1 \\
 \underline{-42} \\
 18 \overline{) 42} (2 \\
 \underline{-36} \\
 6 \overline{) 18} (3 \\
 \underline{-18} \\
 \times
 \end{array}$$

$$\begin{array}{r}
 6 \overline{) 84} (14 \\
 \underline{-84} \\
 \times
 \end{array}$$

$$\begin{array}{r}
 6 \overline{) 108} (18 \\
 \underline{-108} \\
 \times
 \end{array}$$

∴ HCF is 6.

Now,

2	42, 60, 84, 108
2	21, 30, 42, 54
3	21, 15, 21, 27
3	7, 5, 7, 9
3	7, 5, 7, 3
5	7, 5, 7, 1
7	7, 1, 7, 1
	1, 1, 1, 1

The LCM of 42, 60, 84, 108 = $2 \times 2 \times 3 \times 3 \times 3 \times 5 \times 7$
= 3780

(f) 135 and 175.

3	135, 175
3	45, 175
3	15, 175
5	5, 175
5	1, 35
7	1, 7
	1, 1

$$\begin{aligned} \text{The LCM of 135 and 175} &= 3 \times 3 \times 3 \times 5 \times 5 \times 7 \\ &= 4725 \end{aligned}$$

(g) Here, 144 and 120.

2	144, 120
2	72, 60
2	36, 30
2	18, 15
3	9, 15
3	3, 5
5	1, 5
	1, 1

$$\begin{aligned} \text{The LCM of 144 and 120} &= 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 5 \\ &= 720 \end{aligned}$$

(h) Here, 162, 270 and 180.

$$\begin{array}{r} 54 \overline{) 270} \begin{array}{l} 5 \\ -270 \\ \hline \times \end{array} \end{array} \qquad \begin{array}{r} 108 \overline{) 162} \begin{array}{l} 1 \\ -108 \\ \hline 54 \end{array} \begin{array}{l} 108 \begin{array}{l} 2 \\ -108 \\ \hline \times \end{array} \end{array}$$

$$\therefore \text{HCF} = 54$$

The LCM of 162, 270 and 108.

2	162, 270, 108
2	81, 135, 54
3	81, 135, 27
3	27, 45, 9
3	9, 15, 3
3	3, 5, 1
5	1, 5, 1
	1, 1, 1

$$\text{LCM} = 2 \times 2 \times 3 \times 3 \times 3 \times 3 \times 5 = 1620$$

Exercise 7.3

1. The other number

$$= \frac{\text{HCF} \times \text{LCM}}{\text{One of the numbers}} = \frac{5 \times 280}{35} = \frac{280}{7} = 40$$

2. The other number

$$= \frac{\text{HCF} \times \text{LCM}}{\text{One of the numbers}} = \frac{3 \times 120}{15} = \frac{120}{5} = 24$$

3. The other number

$$= \frac{\text{HCF} \times \text{LCM}}{\text{One of the numbers}} = \frac{6 \times 180}{36} = 30$$

4. The other number

$$= \frac{\text{HCF} \times \text{LCM}}{\text{One of the numbers}} = \frac{27 \times 2079}{189} = \frac{2079}{7} = 297$$

5. The HCF of the number = $\frac{\text{One Number} \times \text{Other Number}}{\text{LCM}}$

$$= \frac{12 \times 64}{192} = \frac{12}{3} = 4$$

6. $\text{LCM} = \frac{\text{The product of the numbers}}{\text{HCF}} = \frac{432}{6} = 72$

Exercise 7.4

1. The smallest number, which can be divided by each of the given numbers with no remainder is the LCM of the given numbers. Now, we find the LCM of the numbers.

2	8, 15, 24
2	4, 15, 12
2	2, 15, 6
3	1, 15, 3
5	1, 5, 1
	1, 1, 1

$$\text{LCM} = 2 \times 2 \times 2 \times 3 \times 5 = 120$$

\therefore 120 is the smallest number that can be divided by 6, 8, 12 and 20 with no remainder.

2. The LCM of 18, 24 and 36.

2	18, 24, 36
2	9, 12, 18
2	9, 6, 9
3	9, 3, 9
3	3, 1, 3
	1, 1, 1

$$\text{LCM} = 2 \times 2 \times 2 \times 3 \times 3 = 72$$

The number leaves remainder = 7

\therefore The least number = $72 + 7 = 79$

3. The LCM of 12, 16, 24, 36.

2	12, 16, 24, 36
2	6, 8, 12, 18
2	3, 4, 6, 9
2	3, 2, 3, 9
3	3, 1, 3, 9
3	1, 1, 1, 3
	1, 1, 1, 1

$$\text{LCM} = 2 \times 2 \times 2 \times 2 \times 3 \times 3 = 144$$

The number leaves remainder = 5

$$\therefore \text{The least number} = 144 + 5 = 149$$

4. The HCF of 27 and 33.

$$27 = 3 \times 3 \times 3$$

$$33 = 3 \times 11$$

$$\therefore \text{HCF} = 3$$

The greatest number = 3.

3	27
3	9
3	3
	1

3	33
11	11
	1

5. The HCF of 48, 60 and 64.

2	48
2	24
2	12
2	6
3	3
	1

2	60
2	30
3	15
5	5
	1

2	64
2	32
2	16
2	8
2	4
2	2
	1

$$48 = 2 \times 2 \times 2 \times 2 \times 3$$

$$60 = 2 \times 2 \times 3 \times 5$$

$$64 = 2 \times 2 \times 2 \times 2 \times 2 \times 2$$

$$\therefore \text{HCF} = 2 \times 2 = 4$$

6. The LCM of 9, 12, 15.

2	9, 12, 15
2	9, 6, 15
3	9, 3, 15
3	3, 1, 5
5	1, 1, 5
	1, 1, 1

$$\text{LCM} = 2 \times 2 \times 3 \times 3 \times 5 = 180$$

\therefore They toll together at 180 sec.

7. The LCM of 25, 40, 60.

2	25, 40, 60
2	25, 20, 30
2	25, 10, 15
3	25, 5, 15
5	25, 5, 5
5	5, 1, 1
	1, 1, 1

$$\text{LCM} = 2 \times 2 \times 2 \times 3 \times 5 \times 5 = 600$$

\therefore 600 cm distance will take steps together again.

8. The HCF of 108, 180

2	108
2	54
3	27
3	9
3	3
	1

2	180
2	90
3	45
3	15
5	5
	1

$$108 = 2 \times 2 \times 3 \times 3 \times 3$$

$$180 = 2 \times 2 \times 3 \times 3 \times 5$$

$$\therefore \text{HCF} = 2 \times 2 \times 3 \times 3 = 36$$

$$\text{Each student get chocolate} = \frac{108}{36} = 3 \text{ chocolate}$$

$$\text{Each student got cookies} = \frac{180}{36} = 5 \text{ cookies}$$

Check Yourself

- (a) HCF of two numbers = **Product of two numbers** \div LCM
(b) $\text{LCM} \times \text{HCF} = \text{First number} \times \text{second number}$
(c) HCF of 341 and 583 is **11**.
(d) Two numbers are co-prime if there HCF is **1**.
- (a) True (b) False (c) True (d) False (e) False
- (a) \rightarrow (iii) (b) \rightarrow (v) (c) \rightarrow (iv) (d) \rightarrow (ii) (e) \rightarrow (i)
- (a) (iii) the product of their HCF and LCM.
(b) (i) 25 (c) (ii) their HCF is 18.
(d) (iii) 3. (e) (iii) 120

8. Fractional Numbers

Exercise 8.1

- (a) $\frac{5}{8} + \frac{5}{8} = \frac{5+5}{8} = \frac{10}{8}$
(b) $\frac{5}{12} + \frac{11}{12} = \frac{5+11}{12} = \frac{16}{12}$
(c) $\frac{1}{4} + \frac{1}{4} + \frac{3}{4} = \frac{1+1+3}{4} = \frac{5}{4}$

$$(d) \frac{4}{15} + \frac{7}{15} + \frac{8}{15} = \frac{4+7+8}{15} = \frac{19}{15}$$

$$(e) \frac{1}{10} + \frac{7}{10} + \frac{3}{10} = \frac{1+7+3}{10} = \frac{11}{10}$$

$$(f) \frac{9}{16} + \frac{7}{16} + \frac{3}{16} = \frac{9+7+3}{16} = \frac{19}{16}$$

$$(g) \frac{16}{21} + \frac{4}{21} + \frac{1}{21} = \frac{16+4+1}{21} = \frac{21}{21} = 1$$

$$(h) \frac{12}{19} + \frac{8}{19} + \frac{6}{19} = \frac{12+8+6}{19} = \frac{26}{19}$$

2. (a) $\frac{2}{5} + \frac{3}{10} = \frac{4+3}{10} = \frac{7}{10}$

(b) $\frac{4}{7} + \frac{2}{3} = \frac{12+14}{21} = \frac{26}{21}$

(c) $\frac{4}{9} + \frac{5}{6} = \frac{8+15}{18} = \frac{23}{18}$

(d) $\frac{3}{4} + \frac{11}{12} = \frac{9+11}{12} = \frac{20}{12}$

(e) $\frac{5}{9} + \frac{7}{12} + \frac{1}{3} = \frac{20+21+12}{36} = \frac{53}{36}$

(f) $\frac{3}{4} + \frac{5}{8} + \frac{7}{12} = \frac{18+15+14}{24} = \frac{47}{24}$

(g) $\frac{3}{8} + \frac{5}{16} + \frac{13}{24} = \frac{18+15+26}{48} = \frac{59}{48}$

(h) $\frac{5}{6} + \frac{7}{12} + \frac{11}{8} = \frac{20+14+33}{24} = \frac{67}{24}$

3. (a) $4\frac{2}{5} + 3\frac{1}{5} = \frac{22}{5} + \frac{16}{5} = \frac{22+16}{5} = \frac{38}{5} = 7\frac{3}{5}$

(b) $3\frac{4}{7} + 5\frac{2}{7} = \frac{25}{7} + \frac{37}{7} = \frac{25+37}{7} = \frac{62}{7} = 8\frac{6}{7}$

(c) $6\frac{1}{4} + 3\frac{3}{8} = \frac{25}{4} + \frac{27}{8} = \frac{50+27}{8} = \frac{77}{8} = 9\frac{5}{8}$

(d) $4\frac{1}{6} + 5\frac{7}{12} = \frac{25}{6} + \frac{67}{12} = \frac{50+67}{12} = \frac{117}{12} = 9\frac{9}{12}$

(e) $2\frac{3}{7} + \frac{9}{14} = \frac{17}{7} + \frac{9}{14} = \frac{34+9}{14} = \frac{43}{14} = 3\frac{1}{14}$

$$(f) 2\frac{4}{9} + \frac{2}{3} = \frac{22}{9} + \frac{2}{3} = \frac{22+6}{9} = \frac{28}{9} = 3\frac{1}{9}$$

$$(g) 1\frac{3}{4} + 2\frac{2}{3} + 3\frac{1}{6} = \frac{7}{4} + \frac{8}{3} + \frac{19}{6} = \frac{21+32+38}{12} = \frac{91}{12} = 7\frac{7}{12}$$

$$(h) 2\frac{4}{5} + 1\frac{3}{10} + 2\frac{1}{2} = \frac{14}{5} + \frac{13}{10} + \frac{5}{2} = \frac{28+13+25}{10} = \frac{66}{10} = 6\frac{6}{10}$$

Exercise 8.2

$$1. (a) \frac{9}{4} - \frac{1}{4} = \frac{9-1}{4} = \frac{8}{4} = 2$$

$$(b) \frac{3}{8} - \frac{1}{8} = \frac{3-1}{8} = \frac{2}{8} = \frac{1}{4}$$

$$(c) \frac{7}{10} - \frac{3}{10} = \frac{7-3}{10} = \frac{4}{10} = \frac{2}{5}$$

$$(d) \frac{11}{15} - \frac{8}{15} = \frac{11-8}{15} = \frac{3}{15} = \frac{1}{5}$$

$$2. (a) \frac{1}{2} - \frac{1}{3} = \frac{3-2}{6} = \frac{1}{6}$$

$$(b) \frac{1}{6} - \frac{2}{3} = \frac{6-4}{6} = \frac{2}{6} = \frac{1}{3}$$

$$(c) \frac{5}{6} - \frac{3}{4} = \frac{10-9}{12} = \frac{1}{12}$$

$$(d) \frac{5}{12} - \frac{3}{8} = \frac{10-9}{24} = \frac{1}{24}$$

$$3. (a) 5\frac{2}{3} - 2\frac{3}{4} = \frac{17}{3} - \frac{11}{4} = \frac{68-33}{12} = \frac{35}{12} = 2\frac{11}{12}$$

$$(b) 5\frac{5}{12} - 4\frac{1}{6} = \frac{65}{12} - \frac{25}{6} = \frac{65-50}{12} = \frac{15}{12} = 1\frac{3}{12}$$

$$(c) 5\frac{1}{8} - 3\frac{1}{12} = \frac{41}{8} - \frac{37}{12} = \frac{123-74}{24} = \frac{49}{24} = 2\frac{1}{24}$$

$$(d) 5\frac{3}{10} - 3\frac{7}{15} = \frac{53}{10} - \frac{52}{15} = \frac{159-104}{30} = \frac{55}{30}$$

$$(e) 7\frac{4}{9} - 3\frac{5}{12} = \frac{67}{9} - \frac{41}{12} = \frac{268-123}{36} = \frac{145}{36} = 4\frac{1}{36}$$

$$(f) 5\frac{1}{6} - 1\frac{7}{10} = \frac{31}{6} - \frac{17}{10} = \frac{310-102}{60} = \frac{208}{60} = 3\frac{28}{60}$$

$$(g) 3\frac{3}{4} - \frac{7}{10} = \frac{15}{4} - \frac{7}{10} = \frac{75-14}{20} = \frac{61}{20} = 3\frac{1}{20}$$

$$(h) 1\frac{11}{24} - \frac{7}{8} = \frac{35}{24} - \frac{7}{8} = \frac{35-21}{24} = \frac{14}{24} = \frac{7}{12}$$

Exercise 8.3

$$1. (a) \frac{1}{4} + \frac{3}{4} - \frac{5}{8} = \frac{2+6-5}{8} = \frac{8-5}{8} = \frac{3}{8}$$

$$(b) \frac{7}{8} - \frac{1}{6} + \frac{5}{12} = \frac{21 - 4 + 10}{24} = \frac{31 - 4}{24} = \frac{27}{24}$$

$$(c) \frac{1}{4} - \frac{5}{9} + \frac{7}{12} = \frac{9 - 20 + 21}{36} = \frac{10}{36} = \frac{5}{18}$$

$$(d) \frac{3}{5} + \frac{7}{10} - \frac{1}{2} = \frac{6 + 7 - 5}{10} = \frac{13 - 5}{10} = \frac{8}{10} = \frac{4}{5}$$

$$(e) \frac{3}{10} - \frac{8}{15} + \frac{2}{5} = \frac{9 - 16 + 12}{30} = \frac{21 - 16}{30} = \frac{5}{30}$$

$$(f) \frac{4}{9} - \frac{5}{12} + \frac{1}{4} = \frac{16 - 15 + 9}{36} = \frac{10}{36} = \frac{5}{18}$$

$$(g) 2\frac{1}{3} + 3\frac{1}{6} - 1\frac{5}{12} = \frac{7}{3} + \frac{19}{6} - \frac{17}{12} = \frac{28 + 38 - 17}{12} = \frac{66 - 17}{12} = \frac{49}{12} = 4\frac{1}{12}$$

$$(h) 4\frac{1}{4} - 2\frac{3}{8} + 3 = \frac{17}{4} - \frac{19}{8} + \frac{3}{1} = \frac{34 - 19 + 24}{8} = \frac{58 - 19}{8} = \frac{39}{8} = 4\frac{7}{8}$$

$$2. \frac{3}{5} + \frac{3}{4} + \frac{7}{10} = \frac{12 + 15 + 14}{20} = \frac{41}{20} = 2\frac{1}{20} \text{ m}$$

$$3. 2\frac{3}{4} + 1\frac{1}{3} = \frac{11}{4} + \frac{4}{3} = \frac{33 + 16}{12} = \frac{49}{12} = 4\frac{1}{12} \text{ h}$$

$$4. 4\frac{1}{2} + 3\frac{1}{4} + 1\frac{1}{8} + \frac{3}{4} = \frac{9}{2} + \frac{13}{4} + \frac{9}{8} + \frac{3}{4} = \frac{36 + 26 + 9 + 6}{8} = \frac{77}{8} = 9\frac{5}{8} \text{ kg}$$

$$5. 7\frac{1}{4} - 3\frac{4}{5} = \frac{29}{4} - \frac{19}{5} = \frac{145 - 76}{20} = \frac{67}{20} = 3\frac{9}{20} \text{ metre}$$

$$6. 35 - 23\frac{3}{5} = \frac{35}{1} - \frac{118}{5} = \frac{175 - 118}{5} = \frac{57}{5} = 11\frac{2}{5} \text{ litre}$$

Exercise 8.4

$$1. (a) \frac{21}{25} \times 10 = \frac{42}{5} = 8\frac{2}{5}$$

$$(b) 2\frac{1}{2} \times 6 = \frac{5}{2} \times 6 = \frac{5}{1} \times 3 = 15$$

$$(c) 3\frac{2}{3} \times 8 = \frac{11}{3} \times 8 = \frac{88}{3} = 29\frac{1}{3}$$

$$(d) 4\frac{1}{6} \times 21 = \frac{25}{6} \times 21 = \frac{175}{2} = 87\frac{1}{2}$$

$$(e) 5\frac{3}{8} \times 20 = \frac{43}{8} \times 20 = \frac{215}{2} = 107\frac{1}{2}$$

$$(f) 3\frac{7}{15} \times 25 = \frac{52}{15} \times 25 = \frac{52 \times 5}{3} = \frac{260}{3} = 86\frac{2}{3}$$

$$(g) 10\frac{7}{13} \times 26 = \frac{137}{13} \times 26 = 274$$

$$(h) 2\frac{10}{21} \times 28 = \frac{52}{21} \times 28 = \frac{208}{3} = 69\frac{1}{3}$$

2. (a) $4\frac{9}{14}$ by $1\frac{8}{13} = \frac{65}{14} \times \frac{21}{13} = \frac{15}{2} = 7\frac{1}{2}$

(b) $15\frac{3}{10}$ by $4\frac{1}{6} = \frac{153}{10} \times \frac{25}{6} = \frac{51 \times 5}{2 \times 2} = \frac{255}{4} = 63\frac{3}{4}$

(c) $5\frac{10}{21}$ by $1\frac{17}{46} = \frac{115}{21} \times \frac{63}{46} = \frac{345}{46} = 7\frac{23}{46}$

(d) $17\frac{2}{5}$ by $2\frac{2}{29} = \frac{87}{5} \times \frac{60}{29} = 36$

(e) $23\frac{7}{16}$ by $2\frac{14}{25} = \frac{375}{16} \times \frac{64}{25} = 15 \times 4 = 60$

(f) $40\frac{6}{7}$ by $21\frac{9}{22} = \frac{286}{7} \times \frac{63}{22} = 13 \times 9 = 117$

(g) $\frac{3}{9}$ by $\frac{1}{6}$ by $\frac{2}{3} = \frac{3}{9} \times \frac{1}{6} \times \frac{2}{3} = \frac{1}{27}$

(h) $2\frac{1}{4}$ by $1\frac{1}{5}$ by $3 = \frac{9}{4} \times \frac{6}{5} \times 3 = \frac{81}{10} = 8\frac{1}{10}$

3. (a) $\frac{2}{3} \times \frac{9}{16} \times \frac{4}{27} = \frac{1}{2 \times 9} = \frac{1}{18}$

(b) $\frac{14}{25} \times \frac{35}{51} \times \frac{17}{49} = \frac{2}{5 \times 3} = \frac{2}{15}$

(c) $\frac{42}{65} \times \frac{39}{56} \times \frac{24}{27} = \frac{6}{5 \times 3} = \frac{2}{5}$

(d) $6\frac{7}{8} \times 6\frac{2}{11} \times \frac{3}{10} = \frac{55}{8} \times \frac{68}{11} \times \frac{3}{10} = \frac{17 \times 3}{4 \times 2} = \frac{51}{8} = 6\frac{3}{8}$

(e) $2\frac{1}{9} \times \frac{5}{38} \times 2\frac{1}{5} = \frac{19}{9} \times \frac{5}{38} \times \frac{11}{5} = \frac{11}{9 \times 2} = \frac{11}{18}$

(f) $4\frac{5}{8} \times \frac{27}{35} \times 7 \times 1\frac{3}{37} = \frac{37}{8} \times \frac{27}{35} \times 7 \times \frac{40}{37} = 27$

Exercise 8.5

1. (a) $\frac{1}{4}$ of an hour = $\frac{1}{4} \times 60 = 15$ m
(b) $\frac{4}{5}$ of 40 = $\frac{4}{5} \times 40 = 4 \times 8 = 32$
(c) $\frac{3}{5}$ of one rupee = $\frac{3}{5} \times 100$ p = 60 p
(d) $\frac{7}{9}$ of 40 = $\frac{7}{9} \times 40 = \frac{280}{9} = 31\frac{1}{9}$
(e) $\frac{5}{8}$ of 32 = $\frac{5}{8} \times 32 = \frac{5 \times 4}{24} = 20$
(f) $\frac{1}{4}$ of 96 = $\frac{1}{4} \times 96 = 24$
(g) $\frac{1}{2}$ of one litre = $\frac{1}{2} \times 1000$ ml = 500 ml
(h) $\frac{11}{13}$ of 39 = $\frac{11}{13} \times 39 = 11 \times 3 = 33$
2. (a) Reciprocal of $\frac{2}{5} = \frac{5}{2}$ (b) Reciprocal of 3 = $\frac{1}{3}$
(c) Reciprocal of $\frac{4}{7} = \frac{7}{4}$ (d) Reciprocal of 41 = $\frac{1}{41}$
(e) Reciprocal of $\frac{1}{2} = 2$ (f) Reciprocal of $1\frac{1}{4} = \frac{5}{4} = \frac{4}{5}$
(g) Reciprocal of $\frac{3}{4} = \frac{4}{3}$ (h) Reciprocal of $\frac{7}{8} = \frac{8}{7}$

Exercise 8.6

1. (a) $\frac{3}{8} \div 2 = \frac{3}{8} \times \frac{1}{2} = \frac{3}{16}$
(b) $2\frac{1}{2} \div 1\frac{4}{5} = \frac{5}{2} \div \frac{9}{5} = \frac{5}{2} \times \frac{5}{9} = \frac{25}{18} = 1\frac{7}{18}$
(c) $\frac{4}{5} \div 3 = \frac{4}{5} \times \frac{1}{3} = \frac{4}{15}$
(d) $5\frac{1}{2} \div \frac{1}{2} = \frac{11}{2} \div \frac{1}{2} = \frac{11}{2} \times 2 = 11$

$$(e) 3\frac{3}{4} + 1\frac{1}{2} = \frac{15}{4} + \frac{3}{2} = \frac{15}{4} \times \frac{2}{3} = \frac{5}{2}$$

$$(f) 3\frac{1}{4} + \frac{6}{7} = \frac{13}{4} + \frac{6}{7} = \frac{13}{4} \times \frac{7}{6} = \frac{91}{24} = 3\frac{19}{24}$$

$$(g) 5\frac{1}{2} + 1\frac{1}{2} = \frac{11}{2} + \frac{3}{2} = \frac{11}{2} \times \frac{2}{3} = \frac{11}{3} = 3\frac{2}{3}$$

$$(h) 5\frac{3}{4} + 3\frac{3}{4} = \frac{23}{4} + \frac{15}{4} = \frac{23}{4} \times \frac{4}{15} = \frac{23}{15} = 1\frac{8}{15}$$

2. Product of the two numbers = $2\frac{4}{7} = \frac{18}{7}$

One of the number = $\frac{5}{7}$

Second number = $\frac{18}{7} \div \frac{5}{7} = \frac{18}{7} \times \frac{7}{5} = \frac{18}{5} = 3\frac{3}{5}$

3. Fee of each students = ₹ $1\frac{1}{4} = \frac{5}{4}$

Total amount collected = ₹ 125

∴ Number of students = $125 \div \frac{5}{4} = 25 \times \frac{4}{5} = 25 \times 4 = 100$

4. Number = $\frac{36}{5}$

∴ Number = $\frac{36}{5} \div 36 = \frac{36}{5} \times \frac{1}{36} = \frac{1}{5}$

5. Ribbon of length = $\frac{17}{2}$ m

∴ The length of one piece = $\frac{17}{2} \div 5 = \frac{17}{2} \times \frac{1}{5} = \frac{17}{10} = 1.7$ m

Exercise 8.7

1. (a) $\left(\frac{4}{9} + \frac{7}{9}\right) \times 2\frac{1}{4} = \left(\frac{4+7}{9}\right) \times \frac{9}{4} = \frac{11}{9} \times \frac{9}{4} = \frac{11}{4}$

(b) $\frac{3}{8} \div \left(1\frac{7}{8} - \frac{3}{4}\right) = \frac{3}{8} \div \left(\frac{15}{8} - \frac{3}{4}\right) = \frac{3}{8} \div \left(\frac{15-6}{8}\right)$
 $= \frac{3}{8} \div \frac{9}{8} = \frac{3}{8} \times \frac{8}{9} = \frac{1}{3}$

$$\begin{aligned}
 \text{(c)} \quad 6 + \left\{ 1 + \frac{1}{2} + \left(\frac{3}{4} - \frac{1}{2} \right) \right\} &= 6 + \left\{ 1 + \frac{1}{2} + \left(\frac{3-2}{4} \right) \right\} \\
 &= 6 + \left\{ \frac{2+1}{2} + \frac{1}{4} \right\} = 6 + \left\{ \frac{3}{2} + \frac{1}{4} \right\} = 6 + \left\{ \frac{6+1}{4} \right\} \\
 &= \frac{6}{1} + \frac{7}{4} = \frac{24+7}{4} = \frac{31}{4} = 7\frac{3}{4}
 \end{aligned}$$

$$\begin{aligned}
 \text{(d)} \quad \left\{ \left(13\frac{1}{3} - 12\frac{1}{2} \right) + \frac{5}{6} \right\} \text{ of } \frac{3}{8} &= \left\{ \left(\frac{40}{3} - \frac{25}{2} \right) + \frac{5}{6} \right\} \times \frac{3}{8} \\
 &= \left\{ \left(\frac{80-75}{6} \right) + \frac{5}{6} \right\} \times \frac{3}{8} = \left(\frac{5}{6} \times \frac{6}{5} \right) \times \frac{3}{8} = 1 \times \frac{3}{8} = \frac{3}{8}
 \end{aligned}$$

$$\begin{aligned}
 \text{(e)} \quad 2\frac{1}{2} - \left\{ \frac{13}{4} - \left(3\frac{1}{2} - 1\frac{3}{4} \right) \right\} &= \frac{5}{2} - \left\{ \frac{13}{4} - \left(\frac{7}{2} - \frac{7}{4} \right) \right\} \\
 &= \frac{5}{2} - \left\{ \frac{13}{4} - \left(\frac{14-7}{4} \right) \right\} = \frac{5}{2} - \left[\frac{13}{4} - \frac{7}{4} \right] \\
 &= \frac{5}{2} - \left[\frac{13-7}{4} \right] = \frac{5}{2} - \frac{6}{4} = \frac{10-6}{4} = \frac{4}{4} = 1
 \end{aligned}$$

$$\text{2. (a)} \quad \frac{4}{5} + \frac{7}{15} \text{ of } \frac{8}{9} = \frac{4}{5} \times \frac{15}{7} \times \frac{8}{9} = 4 \times \frac{3}{7} \times \frac{8}{9} = \frac{32}{21} = 1\frac{11}{21}$$

$$\text{(b)} \quad \frac{4}{5} + \frac{7}{15} \times \frac{8}{9} = \frac{4}{5} \times \frac{15}{7} \times \frac{8}{9} = \frac{32}{21} = 1\frac{11}{21}$$

$$\text{(c)} \quad 5\frac{1}{4} + \frac{3}{7} \times \frac{1}{2} = \frac{21}{4} \times \frac{7}{3} \times \frac{1}{2} = \frac{49}{8} = 6\frac{1}{8}$$

$$\text{(d)} \quad 5\frac{1}{4} + \frac{3}{7} \text{ of } \frac{1}{2} = \frac{21}{7} \times \frac{7}{3} \times 2 = \frac{49}{2} = 24\frac{1}{2}$$

$$\begin{aligned}
 \text{(e)} \quad \frac{7}{8} + 2\frac{5}{6} - \frac{11}{12} \times 3\frac{3}{11} &= \frac{7}{8} + \frac{17}{6} - \frac{11}{12} \times \frac{36}{11} = \frac{21+68}{24} - \frac{11}{12} \times \frac{36}{11} \\
 &= \frac{89}{24} - \frac{11}{12} \times \frac{36}{11} = \frac{89}{24} - 3 = \frac{89-72}{24} = \frac{17}{24}
 \end{aligned}$$

$$\begin{aligned}
 \text{(f)} \quad 3\frac{3}{4} + \frac{7}{8} \times 4\frac{1}{6} \times 1\frac{13}{15} &= \frac{15}{4} \times \frac{8}{7} \times \frac{25}{4} \times \frac{28}{15} \\
 &= \frac{15}{4} \times \frac{8}{7} \times \frac{25}{4} \times \frac{28}{15} \\
 &= \frac{15 \times 2 \times 5}{3} = 5 \times 2 \times 5 = 50
 \end{aligned}$$

3. A cloth merchant sold cloth on a day = $75\frac{1}{2}$ m = $\frac{151}{2}$ m

Next day, he sold cloth = $36\frac{2}{4}$ m = $\frac{146}{4}$ m

Total cloth sold = $\frac{151}{2} + \frac{146}{4} = \frac{302 + 146}{4} = \frac{448}{4} = 112$ m

4. Four suitcases weigh = $10\frac{3}{4}$ kg = $\frac{43}{4}$ kg

= $12\frac{1}{2}$ kg = $\frac{25}{2}$ kg = $13\frac{1}{5}$ kg = $\frac{66}{5}$ kg

= $14\frac{1}{4}$ kg = $\frac{57}{4}$ kg

The total weight carried by the porter = $\frac{43}{4} + \frac{25}{2} + \frac{66}{5} + \frac{57}{4}$

= $\frac{215 + 250 + 264 + 285}{20} = \frac{1014}{20} = 50\frac{14}{20}$

5. A rope = $5\frac{2}{3}$ m long = $\frac{17}{3}$ m

The length of one piece = $2\frac{1}{4}$ m = $\frac{9}{4}$ m

The length the of other piece = $\frac{17}{3} - \frac{9}{4} = \frac{68 - 27}{12} = \frac{41}{12} = 3\frac{5}{12}$ m

6. A milkman has = 20 l milk

He sells milk = $15\frac{3}{5}$ l = $\frac{78}{5}$ l

The quantity of milk = $\frac{20}{1} - \frac{78}{5} = \frac{100 - 78}{5} = \frac{22}{5} = 4\frac{2}{5}$ l

Check Yourself

1. (a) $\left[\left(\frac{4}{9} - \frac{1}{9} \right) \text{ of } \left(\frac{2}{5} - \frac{1}{3} \right) \right] = \left(\frac{4-1}{9} \right) \text{ of } \left(\frac{6-5}{15} \right)$
 $= \left(\frac{3}{9} \text{ of } \frac{1}{15} \right) = \frac{3}{9} \times \frac{1}{15} = \frac{1}{45}$

(b) First break sample brackets and at last break **square** brackets.

(c) If numerator and denominator are 4 and 9 respectively, then fraction is **proper**.

(d) Sum is simplified in the order : 'of', '−', '×', '+', '−'.

$$(c) 9.3 = 9 + 0.3 = 9 + \frac{3}{10}$$

$$(d) 24.56 = 24 + 0.5 + 0.06 = 24 + \frac{5}{10} + \frac{6}{100}$$

7. (a) $2 + \frac{3}{10} = 2 + 0.3 = 2.3$

(b) $10 + 5 + \frac{2}{10} + \frac{7}{100} = 10 + 5 + 0.2 + 0.07 = 15 + 0.27 = 15.27$

(c) $7000 + 500 + 20 + \frac{8}{10} + \frac{6}{1000} = 7520 + 0.8 + 0.006 = 7520.806$

(d) $6000 + 50 + 1 + \frac{5}{1000} = 6051 + 0.005 = 6051.005$

8. (a) Five tenths = $\frac{5}{10} = 0.5$ (b) Six hundredths = $\frac{6}{100} = 0.06$

(c) Two ones and eight tenths = $2 + \frac{8}{10} = 2 + 0.8 = 2.8$

(d) Three tens and four tenths = $30 + \frac{4}{10} = 30 + 0.4 = 30.4$

9. (a) 7.21, 14.6, 28.04, 100.9

Like decimals : 28.04, 7.21, 14.6, 100.9

(b) 19.04, 13.75, 120.2, 79.8

Like decimals : 19.04, 13.75, 120.2, 79.8

10. (a) 64.48, 92.4, 7.175, 128.3

Since 7.175 has 3 decimal places and in order to convert the above group of numbers into like decimals, we have to make the number of digits to the right of decimal point equal to 3 decimal places.

∴ The required like decimals are 64.480, 92.400, 7.175, 128.300.

(b) 3.1426, 19.07, 25.8, 41.002.

Since, 3.1426 has four decimal places and in order to convert the above group of number into like decimals, we have to make the number of like decimals, we have to make the number of digits to the right of decimals point equal to 4 decimals places.

∴ The required like decimals are 3.1426, 19.0700, 25.8000, 41.0020.

11. (a) Let us compare the digits at tenths place. 0.4, 0.6, 0.53

Since they are different, so we arrange the number smallest to greatest,

$$0.4 \quad 0.53 \quad 0.6 \Rightarrow \frac{4}{10}, \frac{53}{100}, \frac{6}{10}$$

Thus, $0.4 < 0.53 < 0.6$

- (b) 0.014, 0.8, 0.006

Since they are different at tenths place, so we arrange smallest to greatest.

$$0.\overset{\circ}{0}14 \quad 0.\overset{\circ}{8}00 \quad 0.\overset{\circ}{0}06$$

Here, greatest number is 0.800 but other number cannot be compare by tenths, so, we compare the next digit.

Exercise 9.2

1. (a) 0.14, 4.31 and 0.9

$$\begin{array}{r} 0.14 \\ 4.31 \\ + 0.90 \\ \hline 5.35 \end{array}$$

- (b) 0.1, 1 and 11.40

$$\begin{array}{r} 0.10 \\ 1.00 \\ + 11.40 \\ \hline 12.50 \end{array}$$

- (c) 2.5, 20.50 20.05 and 2.005

$$\begin{array}{r} 2.500 \\ 20.500 \\ 20.050 \\ + 2.005 \\ \hline 45.055 \end{array}$$

- (d) 4.48, 8.4, 8.48 and 4.8

$$\begin{array}{r} 4.48 \\ 8.40 \\ 8.48 \\ + 4.80 \\ \hline 26.16 \end{array}$$

2. (a) 39.26 from 50.04

$$\begin{array}{r} 50.04 \\ - 39.26 \\ \hline 10.78 \end{array}$$

- (b) 05.026 from 317.54

$$\begin{array}{r} 317.540 \\ - 05.026 \\ \hline 312.514 \end{array}$$

- (c) 204.194 from 400.62

$$\begin{array}{r} 400.620 \\ - 204.194 \\ \hline 196.426 \end{array}$$

- (d) 1123.7 from 5604.21

$$\begin{array}{r} 5604.21 \\ - 1123.70 \\ \hline 4480.51 \end{array}$$

3. (a) $0.467 \times 18 = 8.406$

(b) 12.39×236

$$\begin{array}{r} = \times 12.39 \\ \quad 236 \\ \hline \quad 2124 \\ \quad 7080 \\ \quad 47200 \\ \quad 236000 \\ \hline 2924.04 \end{array}$$

(c) 56.88×40

$$\begin{array}{r} = 56.88 \\ \quad \times 40 \\ \hline \quad 0000 \\ \quad 22752 \times \\ \hline 2275.20 \end{array}$$

(d) 0.1564×75

$$\begin{array}{r} = 0.1564 \\ \quad \times 75 \\ \hline \quad 05820 \\ \quad 10948 \times \\ \hline 11.5300 \end{array}$$

Exercise 9.4

1. (a) $98 \div 10 = \frac{98}{10} = 9.8$

(b) $234 \div 100 = \frac{234}{100} = 2.34$

(c) $6405 \div 1000 = \frac{6405}{1000} = 6.405$

(d) $45.5 \div 10 = \frac{45.5}{100} \times \frac{1}{10} = \frac{455}{100} = 4.55$

2. (a) $56.64 \div 2$

$$\begin{array}{r} 2 \overline{) 56.64} \quad (28.32 \\ \underline{-4} \\ 16 \\ \underline{-16} \\ 6 \\ \underline{-6} \\ 4 \\ \underline{-4} \\ \times = 28.32 \end{array}$$

(b) $40.96 \div 16$

$$\begin{array}{r} 16 \overline{) 40.96} \quad (2.56 \\ \underline{-32} \\ 89 \\ \underline{-80} \\ 96 \\ \underline{-96} \\ \times = 2.56 \end{array}$$

(c) $188.28 \div 12$

$$\begin{array}{r} 12 \overline{) 188.28} \quad (15.69 \\ \underline{-12} \\ 68 \\ \underline{-60} \\ 82 \\ \underline{-72} \\ 108 \\ \underline{-108} \\ \times = 15.69 \end{array}$$

(d) $6.300 \div 2.1$

$$\begin{array}{r} 2.1 \overline{) 6.300} \quad (3 \\ \underline{-6.3} \\ 0 \\ \times = 3 \end{array}$$

6. (a) $49 \text{ mm} = 49 \times \frac{1}{10} \text{ cm} = 4.9 \text{ cm}$ $\left[\because 1 \text{ mm} = \frac{1}{10} \text{ cm} \right]$
- (b) $148 \text{ mm} = 148 \times \frac{1}{10} = 14.8 \text{ cm}$ $\left[\because 1 \text{ mm} = \frac{1}{10} \text{ cm} \right]$
- (c) $6 \text{ cm } 4 \text{ mm} = 6 \text{ cm} + \frac{4}{10} \text{ cm} = 6 \text{ cm } 0.4 \text{ cm} = 6.4 \text{ cm}$
- (d) $92 \text{ cm } 2 \text{ mm} = 92 \text{ cm} + \frac{2}{10} \text{ cm}$
 $= 92 \text{ cm} + 0.2 \text{ cm} = 92.2 \text{ cm}$ $\left[\because 1 \text{ mm} = \frac{1}{10} \text{ cm} \right]$
7. (a) $845 \text{ cm} = 845 \times \frac{1}{100} \text{ m} = \frac{845}{100} = 8.45 \text{ m}$ $\left[\because 1 \text{ cm} = \frac{1}{100} \text{ m} \right]$
- (b) $1248 \text{ cm} = 1248 \times \frac{1}{100} \text{ m} = \frac{1248}{100} = 12.48 \text{ cm}$
- (c) $983 \text{ m } 12 \text{ cm} = 983 \text{ m } 12 \times \frac{1}{100} \text{ cm} = 983 \text{ m} + \frac{12}{100} \text{ m}$
 $= 983 \text{ m} + 0.12 \text{ m} = 983.12 \text{ m}$ $\left[1 \text{ cm} = \frac{1}{100} \text{ m} \right]$
- (d) $1755 \text{ m } 36 \text{ cm} = 1755 \text{ m} + 36 \times \frac{1}{100} \text{ m} = 1755 \text{ m} + \frac{36}{100} \text{ m}$
 $= 1755 \text{ m} + 0.36 \text{ m} = 1755.36 \text{ m}$
8. (a) $8145 \text{ g} = 8145 \times \frac{1}{1000} = \frac{8145}{1000} = 8.145 \text{ kg}$ $\left[1 \text{ g} = \frac{1}{1000} \text{ kg} \right]$
- (b) $15005 \text{ g} = \frac{15005}{1000} = 15.005 \text{ kg}$
- (c) $7 \text{ kg } 125 \text{ g} = 7 \text{ kg} + 125 \times \frac{1}{1000} \text{ kg} = 7 \text{ kg} + \frac{125}{1000} \text{ kg}$
 $= 7 \text{ kg} + 0.125 \text{ kg} = 7.125 \text{ kg}$
- (d) $25 \text{ kg } 15 \text{ g} = 25 \text{ kg} + 15 \times \frac{1}{1000} \text{ kg} = 25 \text{ kg} + \frac{15}{1000} \text{ kg}$
 $= 25 \text{ kg} + 0.015 \text{ kg} = 25.015 \text{ kg}$
9. (a) $7575 \text{ paise} = 7575 \times \frac{1}{100} = ₹ \frac{7575}{100} = ₹ 75.75$ $\left[1 \text{ paise} = ₹ \frac{1}{100} \right]$
- (b) $9003 \text{ paise} = ₹ 9003 \times \frac{1}{100} = ₹ \frac{9003}{100} = ₹ 90.03$

$$(c) \quad 5 \text{ rupees } 25 \text{ paise} = ₹ 5 + 25 \times \frac{1}{100} = ₹ 5 \frac{25}{100}$$

$$= ₹ 5 + 0.25 = ₹ 5.25$$

$$(d) \quad 25 \text{ kg } 15 \text{ g} = 25 \text{ kg} + \frac{15}{1000} \text{ kg}$$

$$= 25 \text{ kg } 0.015 \text{ kg} = 25.015 \text{ kg}$$

$$10. (a) \quad 4500 \text{ L} = 4500 \times \frac{1}{1000} \text{ L} = \frac{4500}{1000} = 4.5 \text{ L}$$

$$(b) \quad 10030 \text{ mL} = 10030 \times \frac{1}{1000} \text{ L} = \frac{10030}{1000} \text{ L} = 10.030 \text{ L}$$

$$(c) \quad 12 \text{ L } 275 \text{ mL} = 12 \text{ L} + 275 \times \frac{1}{1000} \text{ L}$$

$$= 12 \text{ L} + 0.275 \text{ L} = 12.075 \text{ L}$$

$$(d) \quad 15 \text{ L } 50 \text{ mL} = 15 \text{ L} + 50 \times \frac{1}{1000} \text{ L}$$

$$= 15 \text{ L} + 0.050 \text{ L} = 15.050 \text{ L}$$

$$11. (a) \quad ₹ 17.25 = 17.25 \times 100 \text{ p} = 1725 \text{ p} \quad [1 ₹ = 100 \text{ p}]$$

$$(b) \quad 9.050 \text{ L} = 9.050 \times 1000 \text{ mL} = 9050 \text{ mL} \quad [1 \text{ L} = 1000 \text{ mL}]$$

$$(c) \quad 15.375 \text{ km} = 15.375 \times 1000 \text{ m} = 15375 \text{ m} \quad [1 \text{ km} = 1000 \text{ m}]$$

$$(d) \quad ₹ 56.35 = 56.35 \times 100 \text{ p} = 5635 \text{ p} \quad [1 ₹ = 100 \text{ p}]$$

Check Yourself

1. (a) $\frac{1}{2}$ expressed as a decimal is **0.5**.

(b) The product of 48.7 and 9.643 will have **4** decimal places.

(c) 0.75 as a fraction in the lowest terms is $\frac{3}{4}$.

(d) 1.64 expressed as a mixed number is $1 + \frac{64}{100}$.

2. (a) True (b) False

(c) False (d) True

3. (a) (iv) 4.271 (b) (iii) 3.08

(c) (i) 9.32 (d) (ii) 0.02

10. Percentage

Exercise 10

1. (a) $\frac{3}{5} = \frac{3}{5} \times 100\% = 60\%$ (b) $\frac{4}{25} = \frac{4}{25} \times 100\% = 16\%$
(c) $\frac{9}{10} = \frac{9}{10} \times 100\% = 90\%$ (d) $\frac{11}{20} = \frac{11}{20} \times 100\% = 55\%$
(e) $\frac{1}{2} = \frac{1}{2} \times 100\% = 50\%$
2. (a) $36\% = \frac{36}{100} = \frac{9}{25}$ (b) $52\% = \frac{52}{100} = \frac{13}{25}$
(c) $20\frac{1}{2}\% = \frac{41}{2}\% = \frac{41}{2 \times 100} = \frac{41}{200}$ (d) $1\frac{1}{8}\% = \frac{9}{8}\% = \frac{9}{8 \times 100} = \frac{9}{800}$
(e) $74\% = \frac{74}{100} = \frac{37}{50}$
3. (a) $0.8 = 0.8 \times 100\% = 80\%$ (b) $0.15 = 0.15 \times 100\% = 15\%$
(c) $3.61 = 3.61 \times 100\% = 361\%$ (d) $4.25 = 4.25 \times 100\% = 425\%$
(e) $7.35 = 7.35 \times 10\% = 735\%$
4. (a) $19\% = \frac{19}{100} = 0.19$ (b) $43.2\% = \frac{43.2}{100} = 0.432$
(c) $88\% = \frac{88}{100} = 0.88$ (d) $89\% = \frac{89}{100} = 0.89$
(e) $64.4\% = \frac{64.4}{100} = 0.644$
5. (a) $40\% \text{ of } 80 = \frac{40}{100} \times 80 = 32$
(b) $13\% \text{ of } 130 = \frac{13}{100} \times 130 = \frac{169}{10} = 16.90$
(c) $100\% \text{ of } 50 = \frac{100}{100} \times 50 = 50$
(d) $25\% \text{ of } \frac{1}{15} = \frac{25}{100} \times \frac{1}{15} = \frac{1}{60}$
6. (a) $30\% \text{ of } 30 \text{ kg} = \frac{30}{100} \times 30 = 9 \text{ kg}$
(b) $10\% \text{ of } ₹ 400 = \frac{10}{100} \times 400 = ₹ 40$

- (c) 18% of $350\text{ m} = \frac{18}{100} \times 350 = 63\text{ m}$
- (d) 12.5% of $24\text{ mL} = \frac{125}{1000} \times 24 = 3\text{ mL}$
7. (a) 20% of ₹ $240 = \frac{20}{100} \times 240 = ₹ 48$
- (b) 2.5% of $360\text{ L} = \frac{25}{1000} \times 360 = \frac{36}{4} = 9\text{ L}$
- (c) $46\frac{1}{2}\%$ of $140\text{ kg} = \frac{93}{2} \times \frac{1}{100} \times 140 = \frac{651}{10} = 65.1\text{ kg}$
- (d) 82% of $1900\text{ m} = \frac{82}{100} \times 1900\text{ m} = 1558\text{ m}$
8. (a) 10% of $x = 18$
 $\frac{10}{100} \times x = 18 \Rightarrow \frac{18 \times 100}{10} = 180$
- (b) 12% of $y = 6$
 $\frac{12}{100} \times y = 6 \Rightarrow y = \frac{6 \times 100}{12} = 50$
9. (a) $\frac{13}{65} \times 100\% = \frac{1}{5} \times 100\% = 20\%$
- (b) $\frac{3}{30} \times 100\% = \frac{1}{10} \times 100\% = 10\%$
10. $1560 \times \frac{15}{100} = \frac{2340}{10} = 234\text{ bulbs}$
11. $150 \times \frac{60}{100} = 90\text{ tickets}$
12. $2500 \times \frac{15}{100} = ₹ 375$
13. $30\text{ kg} \times 30\% = \frac{30 \times 70}{100} = 21\text{ kg}$ [30% less mean 70%]
14. $10350 \times \frac{60}{100} = 6210$

Check yourself

1. (a) $13\text{ g} = 1.3\%$ of a kg (b) $145\text{ ml} = 14.5\%$ of a litre
 (c) $11\text{ paise} = 11\%$ of a rupee (d) $37\text{ cm} = 37\%$ of a metre
 (e) $5.2\text{ cm} = 5.2\%$ of a metre (f) $48.5\text{ g} = 4.85\%$ of a kg

Exercise 11.2

$$\begin{array}{r} 1. \text{ (a)} \quad 9 \text{ h } 30 \text{ min} \\ + 6 \text{ h } 25 \text{ min} \\ \hline 15 \text{ h } 25 \text{ min} \end{array}$$

$$\begin{array}{r} \text{(b)} \quad 12 \text{ h } 50 \text{ min} \\ + 8 \text{ h } 46 \text{ min} \\ \hline 20 \text{ h } 96 \text{ min} \end{array}$$

$$\begin{aligned} \therefore 96 \text{ min} &= (1 \text{ h } 36 \text{ min}) \\ & \quad 20 \text{ h } 96 \text{ min} \\ &= 20 \text{ h} + 1 \text{ h } 36 \text{ min} \\ &= 21 \text{ h } 36 \text{ min} \end{aligned}$$

$$\begin{array}{r} \text{(c)} \quad 7 \text{ h } 18 \text{ min } 25\text{s} \\ + 5 \text{ h } 42 \text{ min } 36\text{s} \\ \hline 12 \text{ h } 60 \text{ min } 61\text{s} \end{array}$$

$$\begin{aligned} \therefore 12 \text{ h} + 1 \text{ h} + 1 \text{ min} + 1 \text{ sec} \\ = 13 \text{ h } 1 \text{ min } 1 \text{ sec} \end{aligned}$$

$$\begin{array}{r} \text{(d)} \quad 13 \text{ h } 9 \text{ min } 53\text{s} \\ + 4 \text{ h } 13 \text{ min } 22\text{s} \\ \hline 17 \text{ h } 22 \text{ min } 75\text{s} \end{array}$$

$$\begin{aligned} \therefore 17 \text{ h } 23 \text{ min } 15 \text{ s} \\ 75 \text{ s} = 1 \text{ min } 15 \text{ s} \end{aligned}$$

$$\begin{array}{r} 2. \text{ (a)} \quad 15 \text{ h } 40 \text{ min} \\ - 7 \text{ h } 13 \text{ min} \\ \hline 8 \text{ h } 27 \text{ min} \end{array}$$

$$\begin{array}{r} \text{(b)} \quad 8 \text{ h } 26 \text{ min} \\ - 5 \text{ h } 32 \text{ min} \\ \hline 2 \text{ h } 54 \text{ min} \end{array}$$

$$\begin{array}{r} \text{(c)} \quad 12 \text{ h } 15 \text{ min } 35\text{s} \\ - 4 \text{ h } 7 \text{ min } 18\text{s} \\ \hline 8 \text{ h } 8 \text{ min } 17\text{s} \end{array}$$

$$\begin{array}{r} \text{(d)} \quad 14 \text{ h } 22 \text{ min } 32 \text{ s} \\ + 6 \text{ h } 36 \text{ min } 44 \text{ s} \\ \hline 7 \text{ h } 45 \text{ min } 48 \text{ s} \end{array}$$

$$\begin{array}{r} 3. \text{ (a)} \quad 2 \text{ h } 17 \text{ min} \\ \quad \quad \times 8 \\ \hline 16 \text{ h } 136 \text{ min} \end{array}$$

$$\begin{aligned} \therefore 18 \text{ h } 16 \text{ min} \\ (\because 136 \text{ min} = 2 \text{ h } 6 \text{ min}) \end{aligned}$$

$$\begin{array}{r} \text{(b)} \quad 7 \text{ h } 4 \text{ min} \\ \quad \quad \times 11 \\ \hline 77 \text{ h } 44 \text{ min} \end{array}$$

$$\begin{array}{r} \text{(c)} \quad 6 \text{ h } 18 \text{ min } 5 \text{ sec} \\ \quad \quad \times 5 \\ \hline 30 \text{ h } 90 \text{ min } 25 \text{ sec} \end{array}$$

$$31 \text{ h } 30 \text{ min } 25 \text{ sec} \quad (\because 90 \text{ min} = 1 \text{ h } 30 \text{ min})$$

$$4. \text{ (a)} \quad 6 \text{ h } 45 \text{ min } 40 \text{ s by } 2$$

$$\therefore 6 \text{ h} = 6 \times 60 \text{ min} = 360 \text{ min} \times 60 = 21600 \text{ s}$$

$$45 \text{ min} = 45 \times 60 = 2700 \text{ s}$$

$$\therefore 21600 \text{ s} + 2700 \text{ s} + 40 \text{ s} = 24340 \text{ s}$$

Now, divide 24340 s by 2

$$\begin{array}{r} 2 \overline{) 24340} \quad (12170 \\ \underline{-2} \\ 04 \\ \underline{-4} \\ 03 \\ \underline{-2} \\ 14 \\ \underline{14} \\ \times \end{array}$$

$$\begin{array}{r} 60 \overline{) 12170} \quad (202 \\ \underline{-120} \\ 170 \\ \underline{-120} \\ 50 \end{array}$$

$$\begin{array}{r} 60 \overline{) 202} \quad (3 \\ \underline{-180} \\ 22 \end{array}$$

$$202 \text{ min } 50 \text{ s} = 3 \text{ h } 22 \text{ min } 50 \text{ s}$$

(b) 17 h 40 min 20 s by 4

$$\therefore 17 \text{ h} = 17 \times 60 \text{ min} = 1020 \text{ min} \times 60 = 61200 \text{ s}$$

$$40 \text{ min} = 40 \times 60 \text{ s} = 2400 \text{ s}$$

$$\therefore 61200 \text{ s} + 2400 \text{ s} + 20 \text{ s} = 63620 \text{ s}$$

$$\begin{array}{r} 4 \overline{) 63620} \quad (15905 \\ \underline{-4} \downarrow \\ 23 \\ \underline{-20} \downarrow \\ 36 \\ \underline{-36} \downarrow \\ 20 \\ \underline{-20} \\ \times \end{array}$$

$$\begin{array}{r} 60 \overline{) 15905} \quad (265.08 \\ \underline{-120} \\ 390 \\ \underline{-360} \\ 305 \\ \underline{-300} \\ 500 \\ \underline{-480} \\ 20 \end{array}$$

$$\begin{array}{r} 60 \overline{) 265.08} \quad (4.3 \\ \underline{-240} \\ 15.08 \end{array}$$

$$= 26 \text{ min } 55 \text{ sec}$$

$$= 4 \text{ h } 20 \text{ min } 55 \text{ sec}$$

5. A train arrives 5 : 20 pm

Late by 3 hours 45 minutes

$$\begin{array}{r} \text{The train arrives} = \quad \text{h} \quad \text{min} \\ \quad \quad \quad \quad \quad \quad 5 \quad 20 \\ \quad \quad \quad \quad \quad \quad + 3 \quad 45 \\ \quad \quad \quad \quad \quad \quad \hline \quad \quad \quad \quad \quad \quad 8 \quad 65 \end{array}$$

$$= 65 \text{ min} = 1 \text{ h } 5 \text{ min} + 8 \text{ h}$$

$$= 9 \text{ h } 5 \text{ min} = 9 : 05 \text{ pm}$$

6. A girl attends a dance class = 1 h 40 min = 100 min

A music class = 50 min

A yoga class = 15 min

Total time spends at her classes = 165 min

= (120 + 45) min = 2 h 45 min

7. A movie duration time = 2 h 30 min = 120 min

The first half time = 55 min = 150 min

The duration of second half = 150 min – 55 min = 95 min

∴ 95 min = 1 h 35 min

8. The journey took place by train = 6 h 30 min

The Journey took place by car = 8 h 15 min

Difference = 8 h 15 min

– 6 h 30 min

1 h 45 min

Exercise 11.3

- (a) Kalyan, Bandra, Vasal Road, Borivali, Vihar, Mumbai Central
(b) New Delhi Hazrat Nizamuddin
(c) Punjab mail, 25 : 05 hours
(d) 20 : 15 hrs
(e) Fzr Bct. Janta Exp 30 : 55 hrs
(f) Goa, Sampark K Exp, 20 : 20 hrs
(g) Paschim Express
- (a) 5 : 40 hr (b) 1 : 55 hr
(c) 2 : 00 pm, 11 : 30 pm (d) Jeddah to Kochi
(e) Do it yourself

Check Yourself

- (a) 8 hr 0 min
(b) Four and a half hours before mid night is 7 : 30 pm.
(c) There 10080 minutes in a week.
(d) 7 : 25 am
(e) 20 August 2014

2. (a) True (b) False (c) False (d) True (e) True
 3. (a) → (v); (b) → (iv); (c) → (i); (d) → (ii); (e) → (iii)
 4. (a) (ii) 2 hr 45 min (b) (iv) 18 hr 30 min
 (c) (i) 10 months (d) (ii) 201 days
 (e) (iv) 1 yr 3 months 15 days

12. Money

Exercise 12.1

1. (a) ₹ 26.50 to paise = ₹ 26.50 = $(26 \times 100 \text{ p}) + 50 \text{ p}$
 $= 2600 \text{ p} + 50 \text{ p} = 2650 \text{ paise}$
 (b) 9900 p to rupees = $9900 \text{ p} = \frac{9900}{100} = ₹ 99$
 (c) 65980 paise to rupees = $65980 \text{ p} = ₹ \frac{65980}{100} = ₹ 659.80$
 (d) ₹ 151.60 to paise = ₹ 151.60 = $151.60 \times 100 \text{ p} = 15160 \text{ p}$
 (e) ₹ 4980.05 to paise = ₹ 4980.05 = $4980.05 \times 100 \text{ p} = 498005 \text{ p}$
 (f) ₹ 7415.15 to paise = ₹ 7415.15 = $7415.15 \times 100 \text{ p} = 741515 \text{ p}$
2. (a)
$$\begin{array}{r} ₹ 743.00 \\ + ₹ 862.15 \\ \hline ₹ 1605.15 \end{array}$$
- (b)
$$\begin{array}{r} ₹ 3716.05 \\ + ₹ 900.30 \\ \hline ₹ 4616.35 \end{array}$$
- (c)
$$\begin{array}{r} ₹ 2186.34 \\ ₹ 799.00 \\ \hline ₹ 6059.78 \\ ₹ 9045.12 \end{array}$$
- (d)
$$\begin{array}{r} ₹ 45862.00 \\ + ₹ 916.24 \\ \hline ₹ 46778.24 \end{array}$$
3. (a)
$$\begin{array}{r} ₹ 624.00 \\ - ₹ 479.38 \\ \hline ₹ 144.62 \end{array}$$
- (b)
$$\begin{array}{r} ₹ 5048.26 \\ - ₹ 1379.84 \\ \hline ₹ 3668.42 \end{array}$$
- (c)
$$\begin{array}{r} ₹ 36842.07 \\ - ₹ 2794.98 \\ \hline ₹ 34047.09 \end{array}$$
- (d)
$$\begin{array}{r} ₹ 2000.75 \\ - ₹ 92.99 \\ \hline ₹ 1907.76 \end{array}$$

<p>4. (a) ₹ 78.05 by 9</p> $ \begin{array}{r} = ₹ 78.05 \\ \times 9 \\ \hline ₹ 702.45 \end{array} $	<p>(b) ₹ 125.32</p> $ \begin{array}{r} \times 14 \\ \hline 50128 \\ 125320 \\ \hline ₹ 1754.48 \end{array} $	<p>(c) ₹ 604.92</p> $ \begin{array}{r} \times 27 \\ \hline 423444 \\ 1209840 \\ \hline ₹ 16332.84 \end{array} $
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<p>5. (a) ₹ 582.42 by 17</p> $ \begin{array}{r} 17 \overline{) 582.42} (34.26 \\ \underline{-51} \\ 72 \\ \underline{-68} \\ 44 \\ \underline{-34} \\ 102 \\ \underline{-102} \\ \times \\ = 34.26 \end{array} $	<p>(b) ₹ 2107.25 by 25</p> $ \begin{array}{r} 25 \overline{) 2107.25} (84.29 \\ \underline{-200} \\ 107 \\ \underline{-100} \\ 72 \\ \underline{-50} \\ 225 \\ \underline{-225} \\ \times \\ = 84.29 \end{array} $
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(c) ₹ 3133.62 by 42

$$\begin{array}{r}
 42 \overline{) 3133.62} (74.61 \\
 \underline{-294} \\
 193 \\
 \underline{-168} \\
 256 \\
 \underline{-252} \\
 42 \\
 \underline{-42} \\
 \times \\
 = 74.61
 \end{array}$$

6. Ravi bought shirts = ₹ 725 × 3 = ₹ 2175

Trousers = ₹ 1025.75 × 2 = ₹ 2051.50

Bracelets = ₹ 2560.85 × 2 = ₹ 5121.70

Ravi pay in all = ₹ 2175 + ₹ 2051.50 + ₹ 5121.70

$$\begin{array}{r}
 = ₹ 5121.70 \\
 ₹ 2051.50 \\
 + ₹ 2175.00 \\
 \hline
 ₹ 9348.20
 \end{array}$$

7. Mrs Mehra goes a grocery shop and purchases 7 kg of rice = ₹ 299.25

$$\text{The cost of rice per kg} = \frac{\text{₹ } 299.25}{7} = \text{₹ } 42.75$$

8. Angelina purchased two sets of table clothes, each costing

$$= \text{₹ } 595 \times 2 = \text{₹ } 1190$$

$$\text{Total money} = \text{₹ } 1500$$

$$\text{Money left} = \text{₹ } 1500 - \text{₹ } 1190 = \text{₹ } 310$$

Exercise 12.2

1. (a) CP = ₹ 840, SP = ₹ 630

Since $SP < CP$, there is a loss

$$\text{So, loss} = 840 - 630 = \text{₹ } 210$$

(b) CP = ₹ 245, SP = ₹ 220

Since, $SP < CP$, there is a loss

$$\text{So, loss} = \text{₹ } 245 - \text{₹ } 220 = \text{₹ } 25$$

(c) CP = ₹ 945, SP = ₹ 850

Since, $SP < CP$, there is a loss

$$\text{So, loss} = \text{₹ } 945 - \text{₹ } 850 = \text{₹ } 95$$

(d) CP = ₹ 180, SP = ₹ 205

Since, $SP > CP$, there is a profit.

$$\text{So, profit} = \text{₹ } 205 - \text{₹ } 180 = \text{₹ } 25$$

2. (a) CP = ₹ 955, Profit = ₹ 155.90

So, the $SP = CP + \text{Profit}$

$$= \text{₹ } 955 + \text{₹ } 155.90 = \text{₹ } 1110.90$$

(b) CP = ₹ 2005, Profit = ₹ 145

So, the $SP = CP + \text{Profit}$

$$= \text{₹ } 2005 + \text{₹ } 145 = \text{₹ } 2150$$

(c) CP = ₹ 780.24, Loss = ₹ 19.75

So, $SP = CP - \text{Loss}$

$$= \text{₹ } 780.24 - \text{₹ } 19.75 = \text{₹ } 760.49$$

(d) CP = ₹ 215, Loss = ₹ 39.50

So, $SP = CP - \text{Loss}$

$$= \text{₹ } 215 - \text{₹ } 39.50 = \text{₹ } 175.50$$

3. (a) CP = ₹ 600, SP = ₹ 630

Now, profit = SP - CP = ₹ 630 - ₹ 600 = ₹ 30

$$\text{Profit percent} = \frac{\text{Profit}}{\text{CP}} \times 100\% = \frac{30}{600} \times 100\% = 5\%$$

(b) CP = ₹ 2220, SP = ₹ 1776

Now, loss = CP - SP = ₹ 2220 - ₹ 1776 = ₹ 444

$$\text{Loss percent} = \frac{\text{Loss}}{\text{CP}} \times 100\% = \frac{444}{2220} \times 100\% = 20\%$$

(c) CP = ₹ 740, SP = ₹ 629

Now, loss = CP - SP = ₹ 740 - ₹ 629 = ₹ 111

$$\text{Loss percent} = \frac{\text{Loss}}{\text{CP}} \times 100\% = \frac{111}{740} \times 100 = 15\%$$

(d) CP = ₹ 950, SP = ₹ 1026

Now, profit = SP - CP = ₹ 1026 - ₹ 950 = ₹ 76

$$\text{Profit percent} = \frac{76}{950} \times 100 = 8\%$$

4. CP of carpet = ₹ 8000

SP of carpet = ₹ 8400 ⇒ Since, SP > CP

∴ Profit = SP - CP = ₹ 8400 - ₹ 8000 = ₹ 400

$$\text{So, profit percent} = \frac{400}{8000} \times 100\% = \frac{400}{80} = 5\%$$

5. CP of a cupboard = ₹ 3200

SP of a cupboard = ₹ 3104

∴ Since SP < CP

∴ Loss = CP - SP = ₹ 3200 - ₹ 3104 = ₹ 96

$$\text{So, loss percent} = \frac{96}{3200} \times 100\% = \frac{96}{32} \% = 3\%$$

6. CP of watch = ₹ 2140

SP of watch at a gain of 10%

$$\text{Profit} = 2140 \times 10\% = 2140 \times \frac{10}{100} = ₹ 214$$

Selling price of watch = ₹ 2140 + ₹ 214 = ₹ 2354

Exercise 12.3

- ₹ 51300; ₹ 7395.00; ₹ 87792.00; 18700.00; 1559.00
- (a) ₹ 55; ₹ 57; ₹ 40; ₹ 30; ₹ 30
(b) ₹ 90 (c) ₹ 425.50
- (a) Birth day cap total ₹ 183.00
(b) Balloon total ₹ 12000, Popup total ₹ 110.75, Total ₹ 413.75

Check Yourself

- (a) Selling price = **cost price** + profit
(b) Cost price = Selling price + **Loss**
(c) Loss percent = $\frac{\text{Loss}}{\text{CP}} \times 100$
(d) Gain or profit percent = $\frac{\text{Profit}}{\text{CP}} \times 100$
- (a) True (b) True (c) True (d) True
- (a) → (iv); (b) → (iii); (c) → (ii); (d) → (i)
- (a) (ii) ₹ 476.00 (b) (iii) ₹ 16
(c) (iii) ₹ 10 (d) (iv) Loss% = $\frac{\text{Loss}}{\text{SP}} \times 100$

13. Temperature

Exercise 13

- (a) 15° C
First convert 15°C into °F. For conversion follow these steps :
Step 1 : Multiple °C by 9. $15 \times 9 = 135$
Step 2 : Divide the product by 5. $135 \div 5 = 27$
Step 3 : Add 32 to the quotient $27 + 32 = 59^\circ\text{F}$
- (b) $28^\circ\text{C} \Rightarrow ^\circ\text{F} = \left(\frac{^\circ\text{C} \times 9}{5}\right) + 32 = \left(\frac{28 \times 9}{5}\right) + 32$
 $= \frac{252}{5} + 32 = 50.4 + 32 = 82.4^\circ\text{F}$

$$(c) 31^{\circ}\text{C} \Rightarrow ^{\circ}\text{F} = \left(\frac{^{\circ}\text{C} \times 9}{5}\right) + 32 = \frac{31 \times 9}{5} + 32$$

$$= \frac{279}{5} + 32 = 55.8 + 32 = 87.8^{\circ}\text{F}$$

$$(d) 42^{\circ}\text{C} \Rightarrow ^{\circ}\text{F} = \frac{^{\circ}\text{C} \times 9}{5} + 32 = \frac{42 \times 9}{5} + 32$$

$$= \frac{378}{5} + 32 = 76.5 + 32 = 107.6^{\circ}\text{F}$$

$$(e) 54^{\circ}\text{C} \Rightarrow ^{\circ}\text{F} = \left(\frac{^{\circ}\text{C} \times 9}{5}\right) + 32 = \frac{54 \times 9}{5} + 32$$

$$= \frac{486}{5} + 32 = 97.2 + 32 = 129.2^{\circ}\text{F}$$

$$2. (a) 36^{\circ}\text{F} \Rightarrow ^{\circ}\text{C} = \frac{(\text{F} - 32) \times 5}{9} = \frac{(36 - 32) \times 5}{9} = \frac{4 \times 5}{9} = \frac{20}{9} = 2.22^{\circ}\text{C}$$

$$(b) 48^{\circ}\text{F} \Rightarrow ^{\circ}\text{C} = \frac{(\text{F} - 32) \times 5}{9} = \frac{(48 - 32) \times 5}{9} = \frac{16 \times 5}{9} = \frac{80}{9} = 8.88^{\circ}\text{C}$$

$$(c) 97^{\circ}\text{F} \Rightarrow ^{\circ}\text{C} = \frac{(\text{F} - 32) \times 5}{9} = \frac{(97 - 32) \times 5}{9}$$

$$= \frac{65 \times 5}{9} = \frac{325}{9} = 36.1^{\circ}\text{C}$$

$$(d) 105^{\circ}\text{F} \Rightarrow ^{\circ}\text{C} = \frac{(\text{F} - 32) \times 5}{9} = \frac{(105 - 32) \times 5}{9}$$

$$= \frac{75 \times 5}{9} = \frac{125}{3} = 41.66^{\circ}\text{C}$$

$$(e) 112^{\circ}\text{F} \Rightarrow ^{\circ}\text{C} = \frac{(\text{F} - 32) \times 5}{9} = \frac{(112 - 32) \times 5}{9}$$

$$= \frac{80 \times 5}{9} = \frac{400}{9} = 44.4^{\circ}\text{F}$$

3.

	Multiply by 9	Divide by 5	Add 32	$^{\circ}\text{F}$
(a)	90	18	50	50
(b)	216	43.2	75.2	75.2
(c)	315	35	67	67
(d)	648	129.6	161.6	161.6
(e)	900	180	212	212

4.	Subtract 32	Multiply by 5	Divide by 9	°C
(a)	27	135	15	15
(b)	57	270	30	30
(c)	63	315	35	35
(d)	72	360	40	40
(e)	180	900	100	100

5. Temperature in early morning = 82.5°F

It increases to its temperature = 100.5°F

$$\therefore \text{Increase in temperature} = 100.5^{\circ}\text{F} - 82.5^{\circ} = 18.0^{\circ}\text{F}$$

6. Temperature in evening = 101.8°F

decreases in the morning temperature = 99.2°F

$$\therefore \text{Decreases in temperature} = 101.8^{\circ}\text{F} - 99.2^{\circ}\text{F} = 2.6^{\circ}\text{F}$$

7. (a) False (b) True

8. On Friday, the temperature = 32.5°C

On Saturday, it increased = 2.2°C

$$\text{Temperature on Sunday} = 32.5^{\circ}\text{C} + 2.2^{\circ}\text{C} = 34.7^{\circ}\text{C}$$

9. The average temperature recorded in Delhi in the month of May
= 40.5°C

The Temperature drops in June = 3.6°C

$$\text{Average temperature in June} = 40.5 - 3.6 = 36.9^{\circ}\text{C}$$

10. The maximum temperature = 35°C

The minimum temperature = 20°C

$$\therefore \text{Difference} = 35^{\circ}\text{C} - 20^{\circ}\text{C} = 15^{\circ}\text{C}$$

$$^{\circ}\text{F} = \left(\frac{^{\circ}\text{C} \times 9}{5} \right) + 32 = \frac{15 \times 9}{5} + 32 = 27 + 32 = 59^{\circ}\text{F}$$

Check Yourself

- (a) Thermometer is used to measure **Temperature of objects**.
(b) Boiling point of water is **100°C** or **212°F** .
(c) Clinical thermometer is marked in **$^{\circ}\text{F}$** .

- (d) Normal human body temperature is 36.89°C or 98.4°F .
 (e) Freezing point of water is 0°C or 32°F .
2. (a) False (b) True (c) True (d) False (e) False
3. (a) \rightarrow (v); (b) \rightarrow (ii); (c) \rightarrow (i); (d) \rightarrow (iv);
 (e) \rightarrow (iv); (f) \rightarrow (ii)
4. (a) (iii) 176°F (b) (i) 167°F (c) (i) 104°F
 (d) (ii) 40°C (e) (iii) 10°C

14. Measurement of Length, Mass and Capacity

Exercise 14.1

1. (a) $5 \text{ mm} = 5 \times \frac{1}{10} \text{ cm} = 0.5 \text{ cm}$ [$\because 1 \text{ mm} = \frac{1}{10} \text{ cm}$]
- (b) $13 \text{ cm } 7 \text{ mm} = 13 \text{ cm} + 7 \times \frac{1}{10} \text{ cm}$
 $= 13 \text{ cm} + 0.7 \text{ cm} = 13.7 \text{ cm}$ [$\because 1 \text{ mm} = \frac{1}{10} \text{ cm}$]
- (c) $9 \text{ dm} = 9 \times 10 \text{ cm} = 90 \text{ cm}$ [$\because 1 \text{ dm} = 10 \text{ cm}$]
2. (a) $75 \text{ cm} = 75 \times \frac{1}{100} \text{ m} = 0.75$ [$\because 1 \text{ cm} = \frac{1}{100} \text{ m}$]
- (b) $2 \text{ m } 75 \text{ cm} = 2 \text{ m} + 75 \times \frac{1}{100} \text{ m}$
 $= 2 \text{ m} + 0.75 \text{ m} = 2.75 \text{ m}$ [$\because 1 \text{ cm} = \frac{1}{100} \text{ m}$]
- (c) $54 \text{ dm} = 54 \times \frac{1}{10} \text{ m} = 5.4 \text{ m}$ [$\because 1 \text{ dm} = \frac{1}{10} \text{ m}$]
3. (a) $35 \text{ cm (as m)} = 35 \times \frac{1}{100} \text{ m} = 0.35 \text{ m}$ [$\because 1 \text{ cm} = \frac{1}{100} \text{ m}$]
- (b) $25 \text{ km} = (\text{as m}) = 25 \times 1000 \text{ m} = 25000 \text{ m}$ [$\because 1 \text{ km} = 1000 \text{ m}$]
- (c) $8 \text{ m } 60 \text{ cm (as cm)} = 8 \text{ m} + 60 \times \frac{1}{100} \text{ m} = 8 \text{ m} + 0.6 \text{ m} = 8.6 \text{ m}$
4. (a) Ruchi's height = 1.25 m
 Akshay taller than Ruchi = $50 \text{ cm} = 50 \times \frac{1}{100} \text{ m} = 0.50 \text{ m}$
 Akshay's height = $1.25 + 0.50 = 1.75 \text{ m}$

(b) One tower = 112 m 50 cm

Another tower = 175 m 75 cm

$$\begin{array}{r} \text{Difference in their heights} = \quad 175 \text{ m } 75 \text{ cm} \\ \quad \quad \quad \quad \quad \quad \quad \quad - 112 \text{ m } 50 \text{ cm} \\ \hline \quad \quad \quad \quad \quad \quad \quad \quad 63 \text{ m } 25 \text{ cm} \end{array}$$

(c) Same as above

(d) Sushant walks daily = 3 km 750 m

He walks in the month of April = 3 km 750 m

$$\begin{array}{r} \quad \quad \quad \quad \quad \quad \quad \quad \times 30 \\ \hline \quad \quad \quad \quad \quad \quad \quad \quad 112500 \end{array} = 112 \text{ km } 500 \text{ m}$$

Exercise 14.2

1. (a) A jar of toffees = 1.5 kg = 1.5×1000 gm

$$= 1500 \text{ gm} \quad [\because 1 \text{ kg} = 1000 \text{ gm}]$$

(b) A basket of fruits = 12.576 kg = 12.576×1000 gm

$$= 12576 \text{ gm} \quad [\because 1 \text{ kg} = 1000 \text{ gm}]$$

(c) A bunch of leaves = 0.01 kg = 0.01×1000 gm

$$= 10 \text{ gm} \quad [\because 1 \text{ kg} = 1000 \text{ gm}]$$

2. (a) 75 mg = $75 \times \frac{1}{1000}$ gm = 0.075 gm [$\because 1 \text{ mg} = 1000 \text{ gm}$]

(b) 250 mg = $250 \times \frac{1}{1000}$ gm = 0.250 gm

(c) 5 gm 240 mg = 5 gm + $240 \times \frac{1}{1000}$ gm
 $= 5 \text{ gm} + 0.240 \text{ gm} = 5.240 \text{ gm}$

(d) 12 dg = $12 \times \frac{1}{10}$ gm = 1.2 gm [$\because 1 \text{ dg} = \frac{1}{10} \text{ gm}$]

3. (a) 40 gm = $40 \times \frac{1}{1000}$ kg = 0.040 kg

(b) 715 dag = $715 \times \frac{1}{1000}$ kg = 7.150 kg

(c) 2375 g = $2375 \times \frac{1}{1000}$ kg = 2.375 kg

(d) 12 kg 50 g = 12 kg + $50 \times \frac{1}{1000}$ kg = 12 kg + 0.050 kg = 12.050 kg

4. (a) A bag contains one book = 2 kg 50 g

One pencil box = 375 g

One note book = 1 kg 250 g

Total weight = 4 kg 125 g

(b) Roop weighs = 25 kg 725 gm

Anwar weighs = 30 kg 250 gm

Anwar weighs more : 30 kg 250 gm

- 25 kg 725 gm

4 kg 525 gm

(c) Weight of a box of apples = 12 kg 250 g

Oranges = 7 kg 300 g

Weight of apples exceed

that of oranges = 12 kg 250 g

- 7 kg 300 g

4 kg 950 g

(d) A pencil box contains 12 pencils

One pencil weighs = 250 mg

The weight of 12 pencils = $250 \times 12 = 3000$ mg

The weight of 12 pencils in grams

$$= 3000 \times \frac{1}{1000} \text{ g} = 3\text{g} \quad \left[\because 1 \text{ mg} = \frac{1}{1000} \text{ g} \right]$$

Exercise 14.3

1. (a) $220 \times \frac{1}{1000} \text{ L} = \frac{220}{1000} = 0.220 \text{ L}$ $\left[\because 1 \text{ mL} = \frac{1}{1000} \text{ L} \right]$

(b) $250 \text{ L } 150 \text{ mL} = 250 \text{ L} + 150 \times \frac{1}{1000} \text{ L}$
 $= 250 \text{ L} + 0.150 \text{ L}$
 $= 250.150 \text{ L}$

(c) $14 \text{ daL} = 14 \times 10 \text{ L} = 140 \text{ L}$ $[\because 1 \text{ daL} = 10 \text{ L}]$

(d) $250 \text{ dL} = 250 \times \frac{1}{10} \text{ L} = 25 \text{ L}$ $\left[\because 1 \text{ dL} = \frac{1}{10} \text{ L} \right]$

2. (a) $45000 \text{ dL (into litre)} = 45000 \times \frac{1}{10} \text{ L} = 4500 \text{ L}$

(b) $3400 \text{ dL (into kilolitre)} = 3400 \times \frac{1}{10000} \text{ kL}$
 $= \frac{3400}{10000} \text{ kL} = 0.34 \text{ kL}$

(c) $750 \text{ L (into daL)} = 750 \times \frac{1}{10} \text{ daL} = 75 \text{ daL}$

(d) $15000 \text{ L (into hL)} = 15000 \times \frac{1}{100} \text{ hL} = 150 \text{ hL}$

3. (a) Two buckets contains 14750 mL and 12895 mL of water.

$$\begin{array}{r} \text{Total quantity of water} = 14750 \text{ mL} \\ + 12895 \text{ mL} \\ \hline 27645 \text{ mL} \end{array}$$

$\therefore 27645 \text{ mL} = 27645 \times \frac{1}{1000} \text{ L} = 27.645 \text{ L}$

and $27645 \text{ mL} = 27 \text{ L } 645 \text{ mL}$

- (b) Juice pulp = 250 mL

Sugar syrup = 500 mL

Milk = 1 L 50 mL

The total quantity of milk shake prepared

$$\begin{array}{r} = 1 \text{ L } 50 \text{ mL} \\ 250 \text{ mL} \\ + 500 \text{ mL} \\ \hline 1 \text{ L } 800 \text{ mL} \end{array}$$

- (c) The capacity of a diesel drum = 500 L

At one pump emptied = 225 L 500 mL

$$\begin{array}{r} \text{The quantity of diesel left in the drum} = 500 \text{ L } 000 \text{ mL} \\ - 225 \text{ L } 500 \text{ mL} \\ \hline 274 \text{ L } 500 \text{ mL} \end{array}$$

- (d) One water melon contains water = 250 mL

15 such water melons contains water = 250×15

$= 3750 \text{ mL} = 3 \text{ L } 750 \text{ mL}$

Check Yourself

- (a) **10000** decimetre are there in one km.
(b) **mm** is the lowest unit of length.
(c) **100000** grams = 1 hectogram.
(d) 1 **KL** = 1000 Litre.
(e) 100 centilitres make **0.1** litre.
- (a) True (b) False (c) False (d) True (e) False
- (a) \rightarrow (ii); (b) \rightarrow (iii); (c) \rightarrow (i); (d) \rightarrow (v); (e) \rightarrow (iv)
- (a) (i) 0.1
(b) (i) 5 kg 195 g
(c) (i) 3 km 7 hm 2 m 5 dm 6 mm
(d) (iii) 1000 litre
(e) (iv) 6.002 L

15. Angles

Exercise 15

- (a) $\angle AOB, \angle BOA$ (b) $\angle PQR, \angle RQP$
(c) $\angle XYZ, \angle ZYX$ (d) $\angle LMN, \angle NML$
- (a) 3, $\angle AOB, \angle BOC, \angle AOC$
(b) 6, $\angle POQ, \angle QOR, \angle ROS, \angle POR, \angle POS, \angle QOS$
- (a) $\angle ABC$ (b) X, Y, Z (c) N, M, L (d) EF
- (a) Acute — $72^\circ, 45^\circ, 38^\circ, 4^\circ, 68^\circ, 55^\circ, 12^\circ, 86^\circ$
(b) Right — 90°
(c) Obtuse — $125^\circ, 175^\circ, 136^\circ, 179^\circ, 164^\circ, 150^\circ, 130^\circ$
(d) Straight — 180°
- (a) Acute angle (b) Obtuse angle (c) Acute angle
- (a) (ii) (b) (i)
- Do it yourself
- Do it yourself
- Do it yourself
- Complementary angles (90°) \rightarrow (b), (c)

11. Supplementary angles (180°) \rightarrow (a), (d)
12. (a) Complement of angle $52^\circ = 90^\circ - 52^\circ = 38^\circ$
 (b) Complement of angle $18^\circ = 90^\circ - 18^\circ = 72^\circ$
 (c) Complement of angle $15^\circ = 90^\circ - 15^\circ = 75^\circ$
 (d) Complement of angle $57^\circ = 90^\circ - 57^\circ = 33^\circ$
13. (a) The supplement of angle $50^\circ = 180^\circ - 50^\circ = 130^\circ$
 (b) The supplement of angle $45^\circ = 180^\circ - 45^\circ = 135^\circ$
 (c) The supplement of angle $118^\circ = 180^\circ - 118^\circ = 62^\circ$
 (d) The supplement of angle $112^\circ = 180^\circ - 112^\circ = 68^\circ$
14. (a) The measures of the bisected angles $= \frac{85^\circ}{2} = 42.5^\circ$
 (b) The measures of the bisected angles $= \frac{100^\circ}{2} = 50^\circ$
 (c) The measures of the bisected angles $= \frac{90^\circ}{2} = 45^\circ$
 (d) The measures of the bisected angles $= \frac{60^\circ}{2} = 30^\circ$
15. (a) The measures of the trisected angles $= \frac{36^\circ}{3} = 12^\circ$
 (b) The measures of the trisected angles $= \frac{162^\circ}{3} = 54^\circ$
 (c) The measures of the trisected angles $= \frac{150^\circ}{3} = 50^\circ$
 (d) The measures of the trisected angles $= \frac{90^\circ}{3} = 30^\circ$
16. Do yourself 17. Do yourself
18. (c) OP seems to be the bisector of the angle because it bisects $\angle AOB$ in two parts.

Check Yourself

1. (a) angle (b) $90^\circ, 180^\circ$ (c) 90°
 (d) Common, Common, either (e) Complete angle
2. (a) False (b) True (c) False (d) True (e) True
3. (a) \rightarrow (iv); (b) \rightarrow (iii); (c) \rightarrow (ii); (d) \rightarrow (i)

4. (a) (ii) acute angle (b) (i) adjacent angle
 (c) (iv) 90° (d) (iii) 55°
 (e) (i) straight angle $>$ acute angle

16. Triangles

Exercise 16

1. (a) The vertices of the triangle are L, M, N .
 (b) The angles of the triangle are $\angle L, \angle M, \angle N$.
 (c) The sides of the triangle are LM, MN, NL .

2. (a) $\angle A = 45^\circ, \angle B = 65^\circ, \angle C = ?$

In $\triangle ABC$,

$$\angle A + \angle B + \angle C = 180^\circ$$

$$45^\circ + 65^\circ + \angle C = 180^\circ$$

$$\angle C = 180^\circ - 110^\circ = 70^\circ$$

- (b) $\angle BAC = 120^\circ, \angle ABC = 30^\circ, \angle BCA = ?$

In $\triangle ABC$,

$$\angle BAC + \angle ABC + \angle BCA = 180^\circ$$

$$120^\circ + 30^\circ + \angle BCA = 180^\circ$$

$$\angle BCA = 180^\circ - 150^\circ = 30^\circ$$

- (c) $\angle A = \angle C = 75^\circ, \angle B = ?$

In $\triangle ABC$,

$$\angle A + \angle B + \angle C = 180^\circ$$

$$75^\circ + \angle B + 75^\circ = 180^\circ$$

$$\angle B = 180^\circ - 150^\circ = 30^\circ$$

- (d) $\angle A = \angle B$ and $\angle C = 90^\circ, \angle A = \angle B = ?$

In $\triangle ABC$,

$$\angle A + \angle B + \angle C = 180^\circ$$

$$\angle A + \angle A + 90^\circ = 180^\circ$$

$$2\angle A = 180^\circ - 90^\circ \Rightarrow \angle A = \frac{90^\circ}{2} = 45^\circ$$

$$\therefore \angle A = \angle B = 45^\circ$$

3. (a) $90^\circ, 60^\circ, 30^\circ$.

The sum of all the three angles of a triangle is always equal to 180° .

$$\text{So, } 90^\circ + 60^\circ + 30^\circ = 180^\circ$$

Thus, triangle is possible.

- (b) $77^\circ, 84^\circ, 20^\circ$.

The sum of all the three angles of a triangle is always equal to 180° .

$$\text{So, } 77^\circ + 84^\circ + 20^\circ = 181^\circ$$

Thus, triangle is not possible.

- (c) $59^\circ, 60^\circ, 61^\circ$.

The sum of all the three angles of a triangle is always equal to 180° .

$$\text{So, } 59^\circ + 60^\circ + 61^\circ = 180^\circ$$

Thus, triangle is possible.

4. The measures of angles of a triangle if all the angles are equal i.e. all angles are of 60° each.

$$\therefore 60^\circ + 60^\circ + 60^\circ = 180^\circ$$

5. Do yourself

6. (a) All sides are equal, then it is an equilateral triangle.

(b) Two sides are equal, then it is an isosceles triangle.

(c) All sides are unequal, then it is a scalene triangle.

7. (a) If in the $\triangle ABC$, $\angle A = 60^\circ$ and $\angle C = 30^\circ$, then the triangle is a right-angled triangle.

Because in $\triangle ABC$,

$$\angle A + \angle B + \angle C = 180^\circ \Rightarrow 60^\circ + \angle B + 30^\circ = 180^\circ$$

$$\angle B = 180^\circ - 90^\circ = 90^\circ$$

- (b) If in the $\triangle PQR$, $\angle P = 50^\circ$ and $\angle R = 20^\circ$, then the triangle is an obtuse-angled triangle.

Because in $\triangle PQR$,

$$\angle P + \angle Q + \angle R = 180^\circ \Rightarrow 50^\circ + \angle Q + 20^\circ = 180^\circ$$

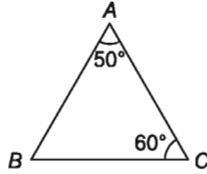
$$\angle Q = 180^\circ - 70^\circ = 110^\circ$$

8. (a) In $\triangle ABC$,

$$\angle A + \angle B + \angle C = 180^\circ$$

$$50^\circ + \angle B + 60^\circ = 180^\circ$$

$$\angle B = 180^\circ - 110^\circ = 70^\circ$$



- (b) $\triangle ABC$ is an acute-angled triangle because all angles are less than 90° .
- (c) In $\triangle PQR$, the two sides PQ and PR are equal i.e. 5 cm, so it is an Isosceles triangle.
- (d) $\triangle LMN$ all the sides are equal i.e. $LM = MN = LN = 4$ cm. So, it is an equilateral triangle.

9.—12. Do yourself

Check Yourself

1. (a) Greater (b) Equal (c) Unequal (d) 90°
2. (a) True (b) False (c) True (d) False
3. (a) (iii) Circle (b) (i) 180°
- (c) (i) 90° (d) (i) all angles are equal to 60° .

17. Quadrilaterals

Exercise 17

1. (a) In quadrilateral $ABCD$,

$$\angle A = 120^\circ, \angle B = 60^\circ \text{ and } \angle C = 90^\circ; \quad \angle D = ?$$

$$\therefore \angle A + \angle B + \angle C + \angle D = 360^\circ$$

$$120^\circ + 60^\circ + 90^\circ + \angle D = 360^\circ$$

$$270^\circ + \angle D = 360^\circ$$

$$\angle D = 360^\circ - 270^\circ \Rightarrow \angle D = 90^\circ$$

(b) In a quadrilateral $ABCD$,

$$\angle B = \angle C = \angle D = 90^\circ; \angle A = ?$$

$$\therefore \angle A + \angle B + \angle C + \angle D = 360^\circ$$

$$\angle A + 90^\circ + 90^\circ + 90^\circ = 360^\circ$$

$$\angle A = 360^\circ - 270^\circ$$

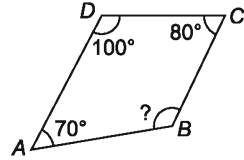
$$\angle A = 90^\circ$$

2. (a) $\therefore \angle A + \angle B + \angle C + \angle D = 360^\circ$

$$70^\circ + \angle B + 80^\circ + 100^\circ = 360^\circ$$

$$\angle B + 250^\circ = 360^\circ$$

$$\angle B = 360^\circ - 250^\circ = 110^\circ$$

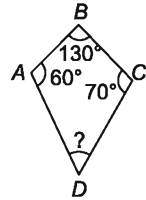


(b) $\therefore \angle A + \angle B + \angle C + \angle D = 360^\circ$

$$60^\circ + 130^\circ + 70^\circ + \angle D = 360^\circ$$

$$260^\circ + \angle D = 360^\circ$$

$$\angle D = 360^\circ - 260^\circ = 100^\circ$$

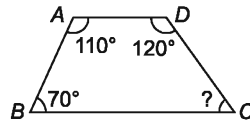


(c) $\therefore \angle A + \angle B + \angle C + \angle D = 360^\circ$

$$110^\circ + 70^\circ + \angle C + 120^\circ = 360^\circ$$

$$\angle C + 300 = 360^\circ$$

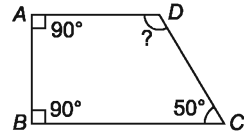
$$\angle C = 360^\circ - 300 = 60^\circ$$



(d) $\therefore \angle A + \angle B + \angle C + \angle D = 360^\circ$

$$90^\circ + 90^\circ + 50^\circ + \angle D = 360^\circ$$

$$\angle D = 360^\circ - 230^\circ = 130^\circ$$



3. (a) AB is parallel to CD .

(b) AD is parallel to BC .

(c) The four angles of the parallelogram are $\angle A, \angle B, \angle C, \angle D$.

(d) The two diagonals of the parallelogram are AC and BD .

(e) The four sides of the parallelogram are AB, BC, CD, DA .

4. (a) $\angle P = 90^\circ$.

(b) The measure of $\angle R$ is 90° .

(c) PQ is parallel to SR .

(d) PS is parallel to QR .

5. (a) All sides of a square are **equal**.
 (b) Each angle of a square has the measure **90°** degree.
 (c) A parallelogram whose all sides are equal is called a **Rhombus**.
 (d) A quadrilateral in which only one pair of opposite sides are parallel is called a **trapezium**.

Check Yourself

1. (a) Opposite sides of a parallelogram are **equal**.
 (b) A quadrilateral with only one pair of opposite sides parallel is called **trapezium**.
 (c) A rhombus has all the sides **equal**.
 (d) Only the **opposite** sides of a rectangle are equal.
2. (a) True (b) True (c) False (d) True
3. (a) (iii) Obtuse (b) (ii) 360° (c) (i) square (d) (i) square

18. Circle

Exercise 18

1. (a) The centre of the circle **O**.
 (b) An arc of the circle **PQ**.
 (c) The diameter of the circle **AB**.
 (d) A chord of the circle **XY**.
 (e) The three radii of the circle **OA, OB, OC**.
 (f) The biggest chord of this circle **AB**.
2. (a) Circumference (b) diameter (c) Arc
 (d) radius (e) chord
3. (a) The diameter of the circle = 8 cm

$$\text{Radius of the circle} = \frac{\text{Diameter}}{2} = \frac{8}{2} = 4 \text{ cm}$$

- (b) The diameter of the circle = 10 cm

$$\text{Radius of the circle} = \frac{\text{Diameter}}{2} = \frac{10}{2} = 5 \text{ cm}$$

(c) The diameter of the circle = 22 cm

$$\text{The radius of the circle} = \frac{\text{Diameter}}{2} = \frac{22}{2} = 11 \text{ cm}$$

(d) The diameter of the circle = 48 cm

$$\text{The radius of the circle} = \frac{\text{Diameter}}{2} = \frac{48}{2} = 24 \text{ cm}$$

4. (a) The radius of the circle = 2.5 cm

$$\begin{aligned}\text{The diameter of the circle} &= \text{radius} \times 2 \\ &= 2.5 \text{ cm} \times 2 = 5.0 \text{ cm}\end{aligned}$$

(b) The radius of the circle = 3 cm

$$\begin{aligned}\text{The diameter of the circle} &= \text{radius} \times 2 \\ &= 3 \times 2 = 6 \text{ cm}\end{aligned}$$

(c) The radius of the circle = 4.5 cm

$$\begin{aligned}\text{The diameter of the circle} &= \text{radius} \times 2 \\ &= 4.5 \times 2 = 9.0 \text{ cm}\end{aligned}$$

(d) The radius of the circle = 7 cm

$$\begin{aligned}\text{The diameter of the circle} &= \text{radius} \times 2 \\ &= 7 \times 2 = 14 \text{ cm}\end{aligned}$$

5. (a) The diameter of the circle = 6 cm

$$\therefore \text{Radius} = \frac{\text{Diameter}}{2} = \frac{6}{2} = 3 \text{ cm}$$

$$\text{The circumference of the circle} = 2\pi \times \text{radius} = 2\pi \times 3 = 6\pi \text{ cm}$$

(b) The diameter of the circle = 7 cm

$$\therefore \text{Radius} = \frac{\text{Diameter}}{2} = \frac{7}{2} = 3.5 \text{ cm}$$

$$\text{The circumference of the circle} = 2\pi \times \text{radius} = 2\pi \times 3.5 = 7\pi \text{ cm}$$

(c) The diameter of the circle = 10 cm

$$\therefore \text{Radius of the circle} = \frac{10}{2} = 5 \text{ cm}$$

$$\text{The circumference of the circle} = 2\pi \times 5 = 10\pi \text{ cm}$$

(d) The diameter of the circle = 15 cm

$$\therefore \text{Radius of the circle} = \frac{15}{2} = 7.5 \text{ cm}$$

$$\text{The circumference of the circle} = 2\pi \times 7.5 = 15\pi \text{ cm}$$

6. (a) The radius of the circle = 3.5 cm
The circumference of the circle = $2\pi \times 3.5 \text{ cm} = 7\pi \text{ cm}$
- (b) The radius of the circle = 6 cm
The circumference of the circle = $2\pi \times 6 = 12\pi \text{ cm}$
- (c) The radius of the circle = 7.5 cm
The circumference of the circle = $2\pi \times 7.5 = 15\pi \text{ cm}$
- (d) The radius of the circle = 9 cm
The circumference of the circle = $2\pi \times 9 = 18\pi \text{ cm}$
7. The diameter of the circle = 9 units
The radius of the circle = $\frac{9}{2} = 4.5 \text{ unit}$
The circumference of the circle = $2\pi \times 4.5 = 9\pi \text{ unit}$
8. The radius of the circle = 7 units
The circumference of the circle = $2\pi \times 7 \text{ units} = 14\pi \text{ units}$
9. Do yourself
10. Do yourself
11. Do yourself
12. Do yourself

Check Yourself

1. (a) Diameter = $2 \times$ radius
(b) A line segment whose end-points lie on the circle is called **chord**.
(c) Circumference = $\pi \times 2R$
(d) Circumference = $2\pi \times R$
(e) A point which is at a greater distance from the centre of a circle than the length of its radius lies in the **Exterior** of the circle.
(f) A line segment whose end-point lie on the circle and which passes through the centre is called **Diameter**.
2. (a) True (b) True (c) False (d) True
(e) True (f) False (g) False
3. (a) \rightarrow (iii), (b) \rightarrow (iv) (c) \rightarrow (i) (d) \rightarrow (ii)
4. (a) (i) diameter (b) (iii) None of these
(c) (ii) 12 cm (d) (iii) 4 cm

19. Area and Volume

Exercise 19.1

1. (a) Area = 39 sq. units (b) Area = 36.5 sq. units
(c) Area = 30 sq. units
2. (a) Length = 4 cm, Breadth = 5 cm
 \therefore Area of the rectangle = Length \times Breadth
 $= 4 \times 5 = 20$ sq. cm.
- (b) Length = 14 cm, Breadth = 8 cm
 \therefore Area of the rectangle = Length \times Breadth
 $= 14 \times 8 = 112$ sq. cm
- (c) Length = 16 m, Breadth = 9 m
 \therefore Area of the rectangle = Length \times Breadth
 $= 16 \times 9 = 144$ sq. m
- (d) Length = 20 m, Breadth = 17 m
 \therefore Area of the rectangle = Length \times Breadth
 $= 20 \times 17 = 340$ sq. m
3. (a) The side of the square = 6 cm
 \therefore Area of the square = (side)²
 $= 6 \times 6 = 36$ sq. cm
- (b) The side of the square = 9 cm
 \therefore Area of the square = (side)²
 $= (9)^2 = 81$ sq. cm.
- (c) The side of the square = 12 cm
 \therefore Area of the square = (side)²
 $= (12)^2 = 144$ sq. cm.
- (d) The side of the square = 21 m
 \therefore Area of the square = (side)² = (21)²
 $= 21 \times 21 = 441$ sq. cm
- (e) The side of the square = 234 m
 \therefore Area of the square = (side)² = (234)²
 $= 234 \times 234 = 54756$ sq. m

4. Area of a badminton court = 240 sq. m

Length = 20 m

Breadth = ?

∴ Area of a badminton court = Length × Breadth

$$240 = 20 \times \text{Breadth}$$

$$\text{Breadth} = \frac{240}{20} = 12 \text{ cm}$$

5. Area of a rectangle = 176 sq. cm

Breadth = 11 cm; Length = ?

∴ Area of a rectangle = Length × Breadth

$$176 = \text{Length} \times 11$$

$$\text{Length} = \frac{176}{11} = 16 \text{ sq cm.}$$

6. Area of a poster = 15 m²

Length of poster = 5 m

Width = ?

∴ Area of a poster = 5 × width 15 = 5 × width

$$\text{Width} = \frac{15}{5} = 3 \text{ cm}$$

7. The perimeter of a volleyball court = 60 m

Its length = 19 m; Width = ?

Perimeter of volleyball court = 2(Long × Width)

$$60 = 2(19 \times \text{Width}) \Rightarrow \frac{60}{2} = (19 + \text{Width})$$

$$\text{Width} = 30 - 19 = 11 \text{ m}$$

8. The perimeter of square painting = 8 m

Side = ?

Perimeter of the square painting = 4 × side

$$8 = 4 \times \text{side} \Rightarrow \text{Side} = \frac{8}{4} = 2 \text{ m}$$

9. The area of the rectangle = 30 cm²

Total area of 4 such rectangles = 4 × 30 cm² = 120 cm²

10. The perimeter of a square cardboard = 24 cm

Area of square cardboard = ?

$$24 = 4 \times \text{side} \Rightarrow \text{Side} = \frac{24}{4} = 6 \text{ cm}$$

$$\text{Area of square cardboard} = (\text{side})^2 = (6)^2 = 36 \text{ cm}^2$$

11. Do yourself

12. The perimeter of rectangular garden = 160 m

Width = 10 m

Perimeter of the rectangle = $2(l + b)$

$$160 = 2(l + 10) \Rightarrow \frac{160}{2} = l + 10$$

$$l = 80 - 10 = 70 \text{ cm}$$

Area of the rectangle = Length \times Breadth

$$= 70 \times 10 = 700 \text{ cm}^2$$

13. Area of the courtyard = Length \times Breadth

$$= 30 \text{ m} \times 15 \text{ m} = 450 \text{ m}^2$$

Cost of tiling at the rate of ₹ 5 per sq. m = $450 \times ₹ 5 = ₹ 2250$

14. Room of the height = 4 m 50 cm

Each side of the room = 6 m

Area of the painting wall = 4 m 50 cm \times 6 m = 2700 m

\therefore the cost of painting = ₹ 10 sq. m

The cost of the painting the walls of a room = $\frac{2700}{10} = ₹ 270$

15. (a) 17 sq. cm

(b) 14 sq. cm

Exercise 19.2

1. (a) 20 cm

(b) 4 cu cm

2. (a) Volume of cube whose each side = 5 cm

Volume = side \times side \times side

$$\therefore \text{Side} = 5 \text{ cm} = 5 \times 5 \times 5 = 125 \text{ cm}^3$$

(b) Volume of cube whose each side = 4 cm

$$\text{Volume} = \text{Side} \times \text{Side} \times \text{Side} = 4 \times 4 \times 4 = 64 \text{ cm}^3.$$

- (c) Volume of cube whose each side = 6 m
 Volume = Side \times Side \times Side = $6 \times 6 \times 6 = 216$ cu m
- (d) Volume of cube whose each side = 7 m
 Volume = Side \times Side \times Side = $7 \times 7 \times 7 = 343$ cu m
3. (a) Length = 5 m, breadth = 4 m, height = 3 m
 Volume of the cuboid = $l \times b \times h$
 $= 5 \times 4 \times 3 = 60$ m³
- (b) Length = 12 m, breadth = 5 m, height = 4 m
 Volume of the cuboid = $l \times b \times h = 12 \times 5 \times 4 = 240$ m³
4. Volume of the cuboid = $15 \times 12 \times 10$ cm = 1800 cu cm
 The volume of cube = $1800 \times 3 = 5400$ cu cm
5. Volume of cuboid = Side \times Side \times Side
 $= 10 \times 10 \times 10 = 1000$ cu m
 Five times the volume of cuboid = $1000 \times 5 = 5000$ cu m
6. Volume of cube $12 \times 12 \times 12 = 1728$ cu m
 Volume of cuboid = $8 \times 6 \times 4 = 48 \times 4 = 192$ cu m
 9 times of volume of cuboid = $192 \times 9 = 1728$ cu m
7. Volume of oil = $8 \times 4 \times 10 = 320$ cu cm.
8. Volume of air in a room = $10 \times 6.5 \times 5 = 325$ cu m
9. Volume of bricks = $25 \times 10 \times 7.5 = 25 \times 75 = 1875$ cu cm
 Volume of wall = $15 \times 2.5 \times 1.25 = 46.875$ cu m
 $= 46.875 \times 10000$ cu cm = 468750 cu cm
 \therefore Required Bricks = $\frac{468750}{1875} = 250$
10. Volume of dimensions = $18 \times 12 \times 10 = 2160$ cu cm
 Volume of wall = $12 \times 80 \times 36 = 34560$ cu cm
 \therefore Ratio cost of bricks = $\frac{34560}{2160} = 16$
 The total bricks at ₹ 750 = $16 \times 750 = ₹ 12000$
11. Do yourself

Check Yourself

- (a) The area of a rectangle is 375 m^2 . If its breadth is 15 m, then its length will be **25 m**.
(b) **Area = Length \times Breadth**
(c) **Area of a square = (side)²**
(d) The volume is measured in **cu m**.
(e) Space occupied by a solid object is called its **volume**.
- (a) False (b) False (c) False (d) False (e) True
- (a) \rightarrow (v) (b) \rightarrow (iv) (c) \rightarrow (ii)
(d) \rightarrow (iii) (e) \rightarrow (i)
- (a) (ii) 144 cm^2 (b) (iii) 27 m
(c) (i) 147 m^2 (d) (i) 1 m^3

20. Commercial Mathematics

Exercise 20.1

- (a) 10 and 16 \Rightarrow Average = $\frac{10+16}{2} = \frac{26}{2} = 13$
(b) 70 g and 76 g \Rightarrow Average = $\frac{70+76}{2} \text{ g} = \frac{146}{2} \text{ g} = 73 \text{ g}$
(c) ₹ 80 and ₹ 90
Average = $\frac{\text{₹ } 80 + \text{₹ } 90}{2} = \frac{\text{₹ } 170}{2} = \text{₹ } 85$
- (a) 4, 11 and 12
Average = $\frac{4+11+12}{3} = \frac{27}{3} = 9$
(b) 100 g, 200 g and 300 g
Average = $\frac{100+200+300}{3} \text{ km} = \frac{600}{3} \text{ g} = 200 \text{ g}$
(c) 45.1 km, 36.51 km, 39.31 km
Average = $\frac{45.1+36.5+39.3}{3} = \frac{120.9}{3} \text{ km} = 40.3 \text{ km}$

3. (a) 15, 27, 18 and 40

$$\text{Average} = \frac{15 + 27 + 18 + 40}{4} = \frac{100}{4} = 25$$

- (b) ₹ 110, ₹ 215, ₹ 87 and ₹ 28

$$\text{Average} = \frac{110 + 215 + 87 + 28}{4} = \frac{440}{4} = ₹ 110$$

4. (a) The first three counting numbers = 2

- (b) The first four odd number = 4

- (c) The first five odd numbers = 5

- (d) The first six even numbers = 7

5. The age of 5 children = 13, 15, 11, 8, 9

$$\text{Average age} = \frac{13 + 15 + 11 + 8 + 9}{5} = \frac{56}{5} = 11 \frac{1}{5}$$

6. A patient's body temperature at morning = 100° F

At Afternoon = 102° F

At night = 101° F

$$\text{Average} = 100 + 102 + 101 = \frac{303}{3} = 101^\circ\text{F}$$

7. A man walked per minute during the five minutes

$$= \frac{51 + 54 + 60 + 64 + 76}{5} = \frac{305}{5} = 61 \text{ m}$$

8. A cricketer scored runs = 20, 10, 120, 0, 150

$$\text{Average score} = \frac{20 + 10 + 120 + 0 + 150}{5} = \frac{300}{5} = 60$$

9. The rainfall during these five months :

May : 8.45 cm

June : 0 cm

July : 0 cm

August : 12 : 42 cm

September : 11 : 28 cm

$$\text{Average rainfall} = \frac{8.45 + 0 + 0 + 12.42 + 11.58}{5} = \frac{32.45}{5} = 6.49 \text{ cm}$$

10. (a) The average of the marks = $\frac{65 + 78 + 98 + 92 + 82}{5} = \frac{415}{5} = 83$

(b) Higher marks than the average marks i.e. Mathematics, Science.

(c) Lower marks than the average marks i.e. Hindi, English, Drawing.

11. A man's total income in the first six months of a year = ₹ 6000

Total income in the last six months of the year = ₹ 7200

The monthly average income for that year

$$= \frac{6000 + 7200}{2} = \frac{13200}{2} = ₹ 6600$$

12. Do yourself

Exercise 20.2

1. (a) The ratio of 10 and 15 = $\frac{10}{15} = 2 : 3$

(b) The ratio of 65 and 39 = $\frac{65}{39} = 5 : 3$

(c) The ratio of 12 g and 18 g = $\frac{12}{18} = 2 : 3$

(d) The ratio of 96 m and 72 m = $\frac{96}{72} = \frac{4}{3} = 4 : 3$

2. Madhavi secured = 75 marks

Radha secured = 45 marks

The ratio of their marks = $\frac{75}{45} = \frac{5}{3} = 5 : 3$

3. In a class, number of boys = 30

Number of girls = 20

The ratio of the number of boys to the number of girls in the class

$$= \frac{30}{20} = 3 : 2$$

4. A building = 20 m tall

Another = 30 m tall

The ratio of their heights = $\frac{20}{30} = 2 : 3$

5. The ratio of their money = 5 : 6

∴ Shabana = ₹ 60 Kiran = ?

$$\frac{n}{60} = \frac{5}{6} \Rightarrow n = \frac{60 \times 5}{6} = 10 \times 5 = ₹ 50$$

6. The ratio of the number of rose plants to the number of sunflower plants in the garden = $\frac{3}{5}$

Sunflowers plants in the garden = 25

Number of rose plants in the garden = x

$$\frac{\text{Number of rose plants}}{\text{Number of sunflowers plants}} = \frac{3}{5}$$

$$\frac{x}{25} = \frac{3}{5} \Rightarrow x = \frac{25 \times 3}{5} = 5 \times 3 = 15 \text{ plants}$$

7. $\frac{16}{24} = \frac{22}{33} \Rightarrow \frac{2}{3} = \frac{2}{3}$

∴ It's true.

Exercise 20.3

1. Speed = $\frac{\text{Distance}}{\text{Time}} = \frac{360 \text{ km}}{4 \text{ h}} = 90 \text{ km/hr}$

2. Speed of bus = $\frac{\text{Distance}}{\text{Time}} = \frac{450 \text{ km}}{10 \text{ h}} = 45 \text{ km/h}$

3. Speed = $\frac{\text{Distance}}{\text{Time}} = \frac{800}{15} = \frac{800}{15} = \frac{1000}{15} = \frac{800}{1000} \times \frac{60}{15} = \frac{48}{15} = 3.2 \text{ km/h}$

4. Sandeep covered a distance = 11 km in 10 min

$$= \frac{11 \text{ km}}{\frac{10}{60} \text{ h}} = \frac{11 \times 60}{10} = 66 \text{ km/hr}$$

Tony covered a distance = 24 km in 20 minutes

$$= \frac{24 \text{ km}}{\frac{20}{60} \text{ h}} = \frac{24 \times 60}{20} = 24 \times 3 = 72 \text{ km/hr}$$

So, Tony drove faster.

5. The distance from Secundrabad and Bhopal = 710 km

Time = 10 hours [7 pm – 6 am and 1 hour stops]

$$\text{Average speed} = \frac{710 \text{ km}}{10 \text{ h}} = 71 \text{ km/hr}$$

6. The total distance covered by bus = 300 km

Time = 12 hours (6 am – 6 : 30 pm and 30 minutes stopped)

$$\therefore \text{Speed of the bus} = \frac{300 \text{ km}}{12 \text{ hr}} = 25 \text{ km/hr}$$

7. Speed = $2\frac{1}{2}$ km/hr = $\frac{5}{2}$ km/hr

$$\text{Time} = 30 \text{ min} = \frac{30}{60} \text{ h} = \frac{1}{2} \text{ hr}$$

$$\text{Distance} = \text{Speed} \times \text{Time} = \frac{5}{2} \times \frac{1}{2} = \frac{5}{4} = 1.25 \text{ km}$$

8. Speed = 75 km/hr

$$\text{Time} = 20 \text{ min} = \frac{20}{60} = \frac{1}{3} \text{ hr}$$

$$\text{Distance} = 75 \times \frac{1}{3} = 25 \text{ km}$$

9. Speed = 600 km/hr Time = 5 hr [5 : 30 am – 10 : 30 am]

$$\text{Distance} = \text{Speed} \times \text{Time} = 600 \times 5 = 3000 \text{ km}$$

10. Speed = 45 km/hr

Distance = 90 km

$$\text{Time} = \frac{\text{Distance}}{\text{Speed}} = \frac{90}{45} = 2 \text{ hr}$$

11. Distance = 12 km

Speed = 15 km/hr

$$\text{Time} = \frac{12}{15} = \frac{4}{5} = 0.8 = 0.8 \times 60 \text{ min} = 48 \text{ min}$$

12. Speed = 25 km/hr

$$\text{Distance} = 800 \text{ metre} = \frac{800}{1000} = \frac{4}{5} \text{ km}$$

$$\text{Time} = \text{Speed} \times \text{Distance} = 25 \times \frac{4}{5} = 20 \text{ h}$$

Exercise 20.4

1. (a) $P = 2000$, $R = 4\%$, $T = 3$ years

$$SI = \frac{P \times R \times T}{100} = \frac{2000 \times 4 \times 3}{100} = 20 \times 12 = ₹ 240$$

(b) $P = ₹ 1800$, $R = 3\frac{1}{9}\% = \frac{28}{9}\%$, $T = 7$ Years

$$SI = \frac{P \times R \times T}{100} = \frac{1800 \times \frac{28}{9} \times 7}{100} = \frac{18 \times 28 \times 7}{9} = 56 \times 7 = ₹ 392$$

(c) $P = ₹ 12000$

$$T = 30 \text{ Months} = \frac{30}{12} \text{ Years} = 2\frac{1}{2} \text{ years} = \frac{5}{2} \text{ year}$$

$$SI = \frac{P \times R \times T}{100} = \frac{12000 \times \frac{5}{2} \times 6}{100} = \frac{120 \times 5 \times 6}{2} = 120 \times 15 = ₹ 1800$$

2. $P = ₹ 5750$, $R = 10\%$, $T = \frac{5}{2}$ Years

$$SI = \frac{P \times R \times T}{100} = \frac{5750 \times 10 \times \frac{5}{2}}{100} = \frac{575 \times 5}{2} = \frac{1875}{2} = ₹ 1437.50$$

3. $P = ₹ 5995$, $T = 3$ years, $I = ₹ 900$

Money deposited by her = ₹ 5995

$$\begin{array}{r} - ₹ 900 \\ \hline ₹ 5095 \end{array}$$

4. $P = ₹ 10,000$, $R = 8\%$

$$T = 7\frac{1}{4} \text{ years} = \frac{29}{4} \text{ years}$$

$$\begin{aligned} SI &= \frac{P \times R \times T}{100} = \frac{10,000 \times 8 \times \frac{29}{4}}{100} \\ &= \frac{100 \times 8 \times 29}{4} = 200 \times 29 = 5800 \end{aligned}$$

Total amount received = ₹ 10000 + 5800 = ₹ 15800

5. $P = ₹ 850, \quad R = 3 \text{ years}, \quad T = 8\%$

$$SI = \frac{P \times R \times T}{100} = \frac{850 \times 3 \times 8}{100} = 8.5 \times 24 = 204.0 = ₹ 204$$

After 3 years

Urmila paid back the loan by giving cash = ₹ 925

loan difference = $925 - 850 = ₹ 75$

The price of the Sari = ₹ $204 - 75 = ₹ 129$

6. $P = ₹ 4575, \quad R = 4\frac{1}{2}\% = \frac{9}{2}\% \quad T = 6 \text{ months} = \frac{1}{2} \text{ years}$

$$\text{So, } SI = \frac{P \times R \times T}{100} = \frac{4575 \times \frac{9}{2} \times \frac{1}{2}}{100} = \frac{41175}{400} = ₹ 102.94$$

Total amount to be return = $4575 + 102.94 = ₹ 4677.94$

7. $P = ₹ 3760, \quad R = 6\%, \quad T = 17 \text{ Months} = \frac{17}{24} \text{ years}$

$$SI = \frac{P \times R \times T}{100} = \frac{3760}{100} \times 6 \times \frac{17}{24} = \frac{38352}{240} = ₹ 159.80$$

The amount return to clear off his debt = ₹ $159.80 \times 2 = 319.60$
 $= ₹ 3760 + ₹ 319.60 = ₹ 4079.60$

8. $P = ₹ 58500, \quad R = 15\%, \quad T = 1\frac{1}{2} \text{ years} = \frac{3}{2} \text{ year}$

$$SI = \frac{P \times R \times T}{100} = \frac{58500 \times 15 \times \frac{3}{2}}{100} = \frac{585 \times 15 \times 3}{2} = \frac{26325}{2} = 13162.50$$

Total amount = $58500 + 13162.50 = ₹ 71,662.50$

9. $P = 10000, \quad T = 3 \text{ years}, \quad R_1 = 5\%, R_2 = 6\%, R_3 = 7\%$

For first year

$$SI = \frac{P \times R \times T}{100} = \frac{10000 \times 3 \times 5}{100} = 100 \times 15 = ₹ 1500 \quad \dots(i)$$

For second year

$$SI = \frac{P \times R \times T}{100} = \frac{10000 \times 3 \times 6}{100} = 100 \times 18 = ₹ 1800$$

For third years,

$$SI = \frac{P \times R \times T}{100} = \frac{10000 \times 3 \times 7}{100} = 100 \times 21 = ₹ 2100$$

$$\text{Total amount} = 1500 + 1800 + 2100 = 5400$$

The total income in 3 years by which the loan was in interest

$$= \frac{5400}{3} = ₹ 1800$$

10. $P = ₹ 2100,$

$$T = 3 \text{ years } 4 \text{ months} = 3 + \frac{4}{12} = 3 + \frac{1}{3} = \frac{10}{3} \text{ years}$$

$$R = -10\frac{1}{2}\% = \frac{21}{2}\%$$

$$\begin{aligned} \text{SI} &= \frac{P \times R \times T}{100} = \frac{2100}{100} \times \frac{10}{3} \times \frac{21}{2} \\ &= 21 \times 5 \times 7 = 21 \times 35 = ₹ 735 \end{aligned}$$

Total amount at the end of 3 years and 4 months

$$= 2100 + 735 = ₹ 2835$$

Check Yourself

- (a) number of terms
(b) $5x$
(c) Same unit
(d) ₹ 30
- (a) False (b) True (c) False (d) True (e) True
- (a) \rightarrow (iv); (b) \rightarrow (iii); (c) \rightarrow (ii); (d) \rightarrow (i)
- (a) (ii) The sum of the quantities/the number of quantities
(b) (iv) 296 (c) (i) $\text{Time} = \frac{\text{Principal} \times \text{Rate}}{100 \times \text{Interest}}$
(d) (ii) 1 : 100 (e) (iii) 1 : 10
(f) (iii) $4\frac{23}{36}$ (g) (i) 1.6 m

21. Representation of Data

Exercise 21

- (a) Shimla is the most favourite holiday destination.
(b) Manali is the least favourite holiday destination.

- (c) 70 people like to visit Shimla for a holiday.
- (d) 50 people like to visit Mussorie for a holiday.

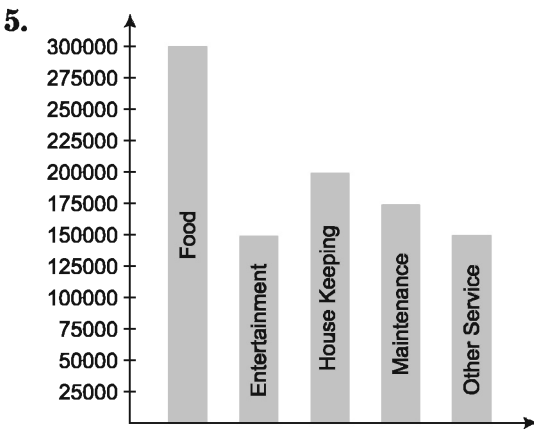
2. (a) May month were the maximum number of calls made.
 (b) February were the least number of calls made.
 (c) 100 calls were made in the month of april.
 (d) 80 calls made by the family in March end.

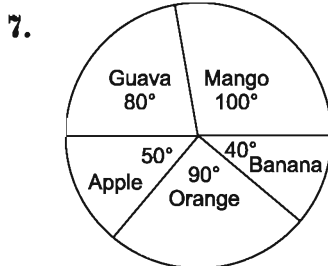
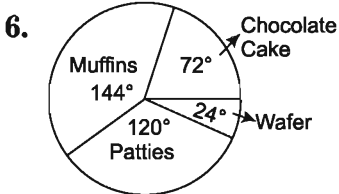
3.

Name	Distance (km)	= 5 km
Rohit	15	● ● ●
Aditya	10	● ●
Salman	25	● ● ● ● ●
Manav	20	● ● ● ●

4.

Name	Read Pages	= 5 km
Arushi	50	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Devesh	45	■ ■ ■ ■ ■ ■ ■ ■ ■
Honey	55	■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Kinjal	40	■ ■ ■ ■ ■ ■ ■ ■ ■
Vini	35	■ ■ ■ ■ ■ ■ ■




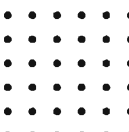


Check Yourself

- (a) Frequency
 (c) Bar graph
 (b) Ungrouped data
 (d) Pie chart
- (a) → (ii);
 (c) → (iii);
 (b) → (ii)
 (d) → (i)
- (a) (iii) both (i) and (ii)
 (c) (iii) Two
 (b) (ii) Pictograph
 (d) (iv) NN III

22. Patterns

Exercise 22.1

- 
- 
- 121, 144, 169
- 66
- (a) 256 (b) 484
- (a) $1 + 3 + 5 + 7 + 9$
 (b) $1 + 3 + 5 + 7 + 9 + 11$
 (c) $1 + 3 + 5 + 7 + 9 + 11 + 13 + 15 + 17 + 19 + 21$
 (d) $1 + 3 + 5 + 7 + 9 + 11 + 13 + 15 + 17 + 19 + 21 + 23$
 (e) $1 + 3 + 5 + 7 + 9 + 11 + 13 + 15$
 (f) $1 + 3 + 5 + 7 + 9 + 11 + 13 + 15 + 17 + 19$
- (a) 49 (b) 100
- Do yourself

11. (a) $6 \times 6 = 1 + 3 + 5 + 7 + 9 + 11$

$7 \times 7 = 1 + 3 + 5 + 7 + 9 + 11 + 13$

$8 \times 8 = 1 + 3 + 5 + 7 + 9 + 11 + 13 + 15$

(b) $36 + 13 = 49$

$49 + 15 = 64$

$64 + 17 = 81$

(c) $36 - 11 = 25$

$25 - 9 = 16$

$16 - 7 = 9$

Exercise 22.2

1. (a) 15, 18, 21

(b) 50, 60, 70

(c)



(d)



3. (a) (i) 16222211 21269 241872 2415222613

(ii) 92281122247 21269 2215232298

(b) (i) I LOVE MY COUNTRY

(ii) Save Water and Electricity

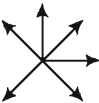
(iii) Happy Diwali

4. Do yourself

Check Yourself

1. (a) 1234567 (b) 74 (c) 16 (d) 34

(e)



2. (a) False (b) True (c) True (d) False (e) False

3. (a) (iii) (b) (i) (c) (ii) (d) (i) (e) (ii)