

Topline

# GRIP On Mathematics

Book **5**

**Teacher's Resource  
Manual**



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## More About Numbers

### Exercise: 1.1

**1. Write the following numbers in figures:**

- (i) 50,13,35,415
- (iii) 72,43,505
- (v) 5,55,505

**2. Write the following numbers in words:**

- (i) Forty five lac, fifty six thousand, three hundred and twenty one.
- (ii) Seven crore, twenty three lac, four thousand, six hundred and thirty five.  
(Note: Consider all odd questions from answer book.)

**3. Write the digits in 5, 43, 627**

- (i) tens  
in the value 5, 43, 627  
the digit '2' is in tens place
- (iii) Ones  
in the value 5,43,627  
the digit '7' is in ones place
- (v) ten thousand  
in the value 5, 43,627  
the digit '4' is in ten thousand place

**4. Write the place value of 5:**

- (i)  $\begin{array}{ccccccc} & C & T & L & T & T & H & T & U \\ 8, & 3 & 4, & 5 & 2, & 4 & 1 & 1 \\ & & & & & & & & \end{array}$   
in the above value '5' is at ten thousand place

- (iii)  $\begin{array}{ccccccc} & T & L & T & T & H & T & U \\ 4 & 4, & 2 & 7, & 0 & 5 & 1 \\ & & & & & & & \end{array}$   
in the above value '5' is at tens place

- (vii)  $\begin{array}{ccccccc} & C & T & L & T & T & H & T & U \\ 3, & 3 & 3, & 5 & 6, & 0 & 4 & 1 \\ & & & & & & & \end{array}$   
in the above value '5' is at ten thousand place

### Exercise: 1.1(b)

**1. Write the following numbers in figures:**

- (i) 7,300,236
- (v) 6,556,444,333
- (iii) 300,200,100

**2. Write the following numbers in words:**

- (Note: Consider all odd number answers from answer book.)

### 3. Write the number in million place.

M HT T H T U  
(i) 3, 1 2 1, 5 0 3  
digit '3' is in million place.

TMM H T T T T H T U  
(iii) 1 7, 7 7 7, 7 7 7  
digit '7' is in million place.

M H T T T T H T U  
(v) 7, 1 2 5, 4 3 9  
digit '7' is in million place.

### 4. Write the place value of 7 and 3 in the following numbers:

M H T T T T H T U  
(i) 5, 7 0 3, 4 5 2  
digit '7' is at hundred thousand place and digit '3' is at thousand place.

M H T T T T H T U  
(iii) 7, 5 0 4, 3 0 1  
digit '7' is at million place and digit '3' is at hundred place.

TMM H T T T T H T U  
(v) 2 6, 7 3 4, 1 8 5  
digit '7' is at hundred thousand place and digit '3' is at ten thousand place.

## Exercise: 1.2

Consider all the answers from answer book.

## Exercise: 1.3

(i) 2, 4, 6, 8, 10, 12, 14, 18, 20, 22, 24, 26, 28, 30

(iii) Even		Odd
42, 64, 78, 80, 92, 100		37, 55, 71, 89

(v) 98 (because 100 is three digit number and 96 is lesser than 98).

(vii) Lets consider 3 and 5 as two consecutive odd numbers

Now the difference will be

$$5 - 3 = 2$$

(ix) first 3-digit number is '100' and it is an even number therefore three digit even number.

(xi) '2' is the only even number that has exactly two factory, '1' and 'itself'

## Decimals

### Exercise: 2.1(a)

1. In the expanded form the above numbers are written as follows.

(ii) 1021.615 =

$$1 \times \overset{\text{thousands}}{\boxed{1000}} + 0 \times \overset{\text{hundreds}}{\boxed{100}} + 2 \times \overset{\text{tens}}{\boxed{10}} + 1 \times \overset{\text{unit}}{\boxed{1}} + 6 \times \overset{\text{tenth}}{\boxed{\frac{1}{10}}} + 1 \times \overset{\text{hundredth}}{\boxed{\frac{1}{100}}} + 5 \times \overset{\text{thousandth}}{\boxed{\frac{1}{1000}}}$$

$$\Rightarrow 1000 + 0 + 20 + 1 + \frac{6}{10} + \frac{1}{100} + \frac{5}{1000}$$

(iii) 92.933 =

$$9 \times \overset{\text{tens}}{\boxed{10}} + 2 \times \overset{\text{unit}}{\boxed{1}} + 9 \times \overset{\text{tenth}}{\boxed{\frac{1}{10}}} + 3 \times \overset{\text{hundredth}}{\boxed{\frac{1}{100}}} + 3 \times \overset{\text{thousandth}}{\boxed{\frac{1}{1000}}}$$

$$\Rightarrow 90 + 2 + \frac{9}{10} + \frac{3}{100} + \frac{3}{1000}$$

2. What does the coloured digits stand for in each decimal.

(i)  $\boxed{0}.25$



Coloured digit 0 is at unit/ones place

(iii) 2.9 $\boxed{3}$



Coloured digit 3 is at hundredth place

(v) 27.5 $\boxed{9}$



Coloured digit 9 is at hundredth place

(vii)  $\boxed{1}173.85$



Coloured digit 1 is at thousand place

(ix) 11 $\boxed{2}$ .67



Coloured digit 2 is at unit/ones place

3. Write the following in expanded notation.

(i) 15.78 =

$$1 \times \overset{\text{tens}}{\boxed{10}} + 5 \times \overset{\text{unit}}{\boxed{1}} + 7 \times \overset{\text{tenth}}{\boxed{\frac{1}{10}}} + 8 \times \overset{\text{hundredth}}{\boxed{\frac{1}{100}}}$$

$$\Rightarrow 10 + 5 + \frac{7}{10} + \frac{8}{100}$$

(iii) 64.387 =

$$6 \times \overset{\text{tens}}{\boxed{10}} + 4 \times \overset{\text{unit}}{\boxed{1}} + 3 \times \overset{\text{tenth}}{\boxed{\frac{1}{10}}} + 8 \times \overset{\text{hundredth}}{\boxed{\frac{1}{100}}} + 7 \times \overset{\text{thousandth}}{\boxed{\frac{1}{1000}}}$$

$$\Rightarrow 60 + 4 + \frac{3}{10} + \frac{8}{100} + \frac{7}{1000}$$

$$(v) 2576.007 =$$

$$2 \times \overset{\text{thousands}}{\boxed{1000}} + 5 \times \overset{\text{hundreds}}{\boxed{100}} + 7 \times \overset{\text{tens}}{\boxed{10}} + 6 \times \overset{\text{unit}}{\boxed{1}} + 0 \times \overset{\text{tenth}}{\boxed{\frac{1}{10}}} + 0 \times \overset{\text{hundredth}}{\boxed{\frac{1}{100}}} + 7 \times \overset{\text{thousandth}}{\boxed{\frac{1}{1000}}}$$

$$\Rightarrow 2000 + 500 + 70 + 6 + \frac{0}{10} + \frac{0}{100} + \frac{7}{1000}$$

**4. Write the following as decimals.**

(i)  $\frac{6}{10}$  move the decimal point 1 step left because 10 has only 1 zero.

$$\Rightarrow 0.6$$

(iii)  $\frac{8}{1000}$  move the decimal point 3 step left because 1000 has only 3 zero.

$$\Rightarrow 0.008$$

(v)  $10\frac{4}{10}$  move the decimal point 1 step left because 10 has only 1 zero.

$$\Rightarrow 10.4$$

**Exercise: 2.1(b)**

**1. Consider answer from answer book.**

**Exercise: 2.2**

**1. Add the following**

(i)  $4.56 + 8.17$

$$\begin{array}{r} 4.56 \\ 8.17 \\ \hline 12.73 \end{array}$$

(iii)  $79.46 + 23.23$

$$\begin{array}{r} 79.46 \\ 23.23 \\ \hline 102.69 \end{array}$$

(v)  $7.25 + 2.75$

$$\begin{array}{r} 7.25 \\ 2.75 \\ \hline 10.00 \end{array}$$

(vii)  $162.8 + 225.7$

$$\begin{array}{r} 162.8 \\ 225.7 \\ \hline 388.5 \end{array}$$

(ix)  $170.05 + 124.75$

$$\begin{array}{r} 170.05 \\ 124.75 \\ \hline 294.80 \end{array}$$

(xi)  $38.93 + 22.76$

$$\begin{array}{r} 38.93 \\ 22.76 \\ \hline 61.69 \end{array}$$

**2. Now add these (first change the fractions to decimals)**

(i)  $1\frac{2}{10} + 3\frac{8}{10}$

first change mixed fractions into decimal

$$1\frac{2}{10} \Rightarrow 1.2 \text{ and } 3\frac{8}{10} = 3.8$$

$$\begin{array}{r} 1.2 \\ + 3.8 \\ \hline 5.0 \end{array}$$

$$(iii) 6 \frac{2}{10} + 8 \frac{17}{100}$$

$$6 \frac{2}{10} = 6.2 \text{ and } 8 \frac{17}{100} = 8.17$$

$$\begin{array}{r} 6.20 \\ + 8.17 \\ \hline 14.37 \end{array} \quad \text{(You can add as many zero as you want after decimal point)}$$

$$(v) \frac{8}{10} + 9.4$$

$$\frac{8}{10} = 0.8$$

$$\begin{array}{r} 0.8 \\ + 9.4 \\ \hline 10.2 \end{array}$$

$$(vii) 3 \frac{15}{100} + 7 \frac{25}{100}$$

$$3 \frac{15}{100} \Rightarrow 3.15 \text{ and } 7 \frac{25}{100} \Rightarrow 7.25$$

$$\begin{array}{r} 3.15 \\ + 7.25 \\ \hline 10.30 \end{array}$$

$$(ix) 2.54 + 3 \frac{6}{100}$$

$$3 \frac{6}{100} \Rightarrow 3.06$$

$$\begin{array}{r} 2.54 \\ + 3.06 \\ \hline 5.60 \end{array}$$

### 3. Subtract the following:

$$(i) \begin{array}{r} 1.95 \\ - 0.76 \\ \hline 1.19 \end{array}$$

$$(iii) \begin{array}{r} 8.17 \\ - 5.46 \\ \hline 2.71 \end{array}$$

$$(v) \begin{array}{r} 18.729 \\ - 5.875 \\ \hline 12.854 \end{array}$$

$$(vii) \begin{array}{r} 58.10 \\ - 27.06 \\ \hline 31.04 \end{array}$$

$$(ix) \begin{array}{r} 57.47 \\ - 39.48 \\ \hline 17.99 \end{array}$$

$$(xi) \begin{array}{r} 156.7 \\ - 112.8 \\ \hline 43.9 \end{array}$$

### 4. Now subtract these (first change fraction into decimal)

$$(i) 4 \frac{1}{10} - 2 \frac{2}{100}$$

$$4 \frac{1}{10} = 4.1 \text{ and } 2 \frac{2}{100} = 2.02$$

$$(v) \frac{54}{100} - \frac{27}{100}$$

$$\frac{54}{100} = 0.54 \text{ and } \frac{27}{100} = 0.27$$

$$\begin{array}{r} 0.54 \\ - 0.27 \\ \hline 0.27 \end{array}$$

$$(ix) 8 \frac{17}{100} - 3 \frac{21}{100}$$

$$8 \frac{17}{100} \Rightarrow 8.17 \text{ and } 3 \frac{21}{100} \Rightarrow 3.21$$

$$\begin{array}{r} 8.17 \\ - 3.21 \\ \hline 4.96 \end{array}$$

$$(iii) 7.8 - 2 \frac{1}{10}$$

$$\begin{array}{r} 7.8 \\ 2.1 \\ \hline 5.7 \end{array}$$

$$2 \frac{1}{10} = 2.1$$

$$(vii) 7 - \frac{25}{100}$$

$$\frac{25}{100} = 0.25$$

$$\begin{array}{r} 7.100 \\ - 0.25 \\ \hline 6.75 \end{array}$$

(you can add as many zeros as you want after decimal point).

## Exercise: 2.3(a)

Now find the products using the above rule

(i)  $0.25 \times 10$

(move decimal point 1 step right because 10 has 1 zero)

$$0.25 \times 10 = 2.5$$

(iii)  $0.17 \times 100$

(move decimal point 2 steps right because 100 has 2 zeros)

$$0.17 \times 100 = 17$$

(v)  $31.59 \times 1000$

(move decimal point 3 steps right because 1000 has 3 zeros)

$$31.59 \times 1000 = 31590$$

(vii)  $7.5 \times 100$

(move decimal point 2 steps right because 100 has 2 zeros)

$$7.5 \times 100 = 750$$

(ix)  $52.5 \times 1000$

(move decimal point 3 steps right because 1000 has 3 zeros)

$$52.5 \times 1000 = 52500$$

(xi)  $0.079 \times 100$

(move decimal point 2 steps right because 100 has 2 zeros)

$$0.079 \times 100 = 7.9$$

## Exercise: 2.3(b)

### 1. Find the product

(i)  $16.0 \times 1.4$

$$\frac{163}{10} \times \frac{14}{10}$$

$$\frac{2282}{100} \times 22.82$$

(iii)  $0.05 \times 3.1$

$$\frac{5}{100} \times \frac{31}{10}$$

$$\frac{155}{1000} = 0.155$$

(v)  $75 \times 3.5$

$$\frac{75}{1} \times \frac{35}{10}$$

$$\frac{2625}{10} = 262.5$$

(vii)  $1.37 \times 1.24$

$$\frac{137}{100} \times \frac{124}{100}$$

$$\frac{16988}{10000} = 1.6988$$

(ix)  $603.8 \times 2.62$

$$\frac{6038}{10} \times \frac{262}{100}$$

$$\frac{1581956}{1000} = 1581.956$$

### 2. Find the product

(i)  $0.8 \times 9.15$

$$\frac{8}{10} \times \frac{915}{100}$$

$$\frac{7320}{1000} \times 7.32$$

(iii)  $8.7 \times 2$

$$\frac{87}{10} \times \frac{2}{1}$$

$$\frac{174}{10} = 17.4$$

(v)  $23.6 \times 12$

$$\frac{236}{10} \times \frac{12}{1}$$

$$\frac{2832}{10} = 283.2$$

$$(vii) 3.82 \times 19.6$$

$$\frac{382}{100} \times \frac{196}{10}$$

$$\frac{74872}{1000} = 74.872$$

$$(ix) 5.72 \times 2.41$$

$$\frac{572}{100} \times \frac{241}{100}$$

$$\frac{137852}{10000} = 13.7852$$

$$(xi) 0.11 \times 11.11$$

$$\frac{11}{100} \times \frac{1111}{100}$$

$$\frac{12221}{10000} = 1.2221$$

## Exercise: 2.4(a)

Divide

$$(i) 0.6 \text{ by } 2$$

$$\begin{array}{r} 2 \overline{)0.6} \ 0.3 \\ \underline{0 \downarrow} \\ 6 \\ \underline{6} \\ 0 \end{array}$$

$$(iii) 0.25 \text{ by } 5$$

$$\begin{array}{r} 5 \overline{)0.25} \ 0.0 \\ \underline{0 \downarrow \downarrow} \\ 25 \end{array}$$

$$(v) 0.48 \text{ by } 6$$

$$\begin{array}{r} 6 \overline{)0.48} \ 0.08 \\ \underline{0 \downarrow \downarrow} \\ 48 \\ \underline{48} \\ 0 \end{array}$$

You have put 0 if you want to bring two number down together

$$(vii) 0.72 \text{ by } 8$$

$$\begin{array}{r} 8 \overline{)0.72} \ 0.09 \\ \underline{0 \downarrow \downarrow} \\ 72 \\ \underline{72} \\ 00 \end{array}$$

$$(ix) 0.48 \text{ by } 4$$

$$\begin{array}{r} 4 \overline{)0.48} \ 0.12 \\ \underline{0 \downarrow} \\ 4 \\ \underline{4} \\ 08 \\ \underline{08} \\ 8 \\ \underline{8} \\ 0 \end{array}$$

$$(xi) 0.77 \text{ by } 7$$

$$\begin{array}{r} 7 \overline{)0.77} \ 0.11 \\ \underline{0 \downarrow} \\ 07 \\ \underline{07} \\ 7 \\ \underline{7} \\ 0 \end{array}$$

## Exercise: 2.4(b)

1. Now give the answers to these, you don't have to divide actually.

$$(i) 0.001 \div 2$$

$$0.0001$$

$$(iii) 0.15 \div 10$$

$$0.015$$

$$(v) 36.9 \div 100$$

$$0.369$$

$$(vii) 0.191 \div 1000$$

$$0.000191$$

$$(ix) 465.78 \div 1000$$

$$0.465787$$

$$(xi) 7.93 \div 10000$$

$$0.000793$$

## Exercise: 2.5

Do these divisions

$$(i) 13.2 \div 0.04$$

$$\begin{array}{r} 4 \overline{)1320} \ 330 \\ \underline{12 \downarrow \downarrow} \\ 120 \\ \underline{120} \\ xxx \end{array}$$

$$(iii) 0.91 \div 0.07 \Rightarrow$$

$$\begin{array}{r} 7 \overline{)91} \ 13 \\ \underline{91} \\ 00 \end{array}$$

$$0.91 \div 0.07 = 13$$

Firstly, we need to make the divisor to a whole number  
 $0.91 \div 0.07$

$$(v) 13.5 \div 1.5 = 9$$

$$\begin{array}{r} 15 \overline{)135} \ 0.08 \\ \underline{135} \\ xxx \end{array}$$

$$(vii) 9.375 \div 6.25 = 1.5$$

$$\begin{array}{r} 625 \overline{)9375} \ 1.5 \\ \underline{625 \downarrow} \\ 312.5 \\ \underline{312.5} \\ 000 \end{array}$$



$$(ix) 110.4 \div 0.23 = 480$$

$$\begin{array}{r}
 23 \overline{)11040} \quad 480 \\
 \underline{92} \quad \downarrow \downarrow \\
 1840 \\
 \underline{1840} \\
 \text{xx}
 \end{array}$$

$$(xi) 19.272 \div 1.46 = 13.2$$

$$\begin{array}{r}
 146 \overline{)1927.2} \quad 13.2 \\
 \underline{146} \quad \downarrow \downarrow \\
 467.2 \\
 \underline{467.2} \\
 \text{xxx}
 \end{array}$$

$$(xiii) 144.48 \div 2.4 = 60.2$$

$$\begin{array}{r}
 24 \overline{)1444.8} \quad 60.2 \\
 \underline{144} \quad \downarrow \downarrow \\
 000 \\
 \underline{4.8} \\
 00
 \end{array}$$

$$(xiii) 14.144 \div 1.36 = 10.4$$

$$\begin{array}{r}
 136 \overline{)1414.4} \quad 10.4 \\
 \underline{136} \quad \downarrow \downarrow \\
 54.4 \\
 \underline{54.4} \\
 \text{xxx}
 \end{array}$$

### Exercise: 2.6

$$(i) < \quad (iii) < \quad (v) < \quad (vii) > \quad (ix) <$$

### Exercise: 2.7 Word Problems

$$(i) 276.59$$

$$(iii) \text{ Filled can} \quad 3.1$$

$$\begin{array}{r}
 \text{Empty can} \quad 1.25 \\
 \boxed{1.85}
 \end{array}$$

$$(v) \quad 73$$

$$\begin{array}{r}
 9.8 \\
 \boxed{82.8}
 \end{array}$$

$$(vii) 20 \text{ number multiplied by } 4.5 \text{ will yield } 90.$$

$$(ix) \text{ Perimeter of square} = 19.6$$

$$\text{One side} = ?$$

$$19.6 \div 4 = 4.9$$

$$\begin{array}{r}
 40 \overline{)196} \quad 4.9 \\
 \underline{196} \\
 \text{xxx}
 \end{array}$$

$$(v) \quad 1.3 \quad 0.6 \quad 1.1$$

$$0.8 \quad 1 \quad 1.2$$

$$0.9 \quad 1.4 \quad 0.7$$

### Fun Time

$$(iii) \text{ Two and Twenty Seven hundredth} = 2.27 = \text{Two point two seven.}$$

$$(v) \text{ Thirty four thousandths} = 0.034 = \text{zero. zero three four}$$

### Fun Time

$$0.8 \quad 0.3 \quad 0.4$$

$$0.6 \quad 0.7 \quad 0.2$$

$$0.1 \quad 0.5 \quad 0.9$$

### Exercise: 2.8

**Q1:** => Consider the answers from the book.

**Q2:** Change into centimeters

$$(i) 10\text{mm} = 1\text{cm}$$

$$(iii) 120\text{mm} = 12\text{cm}$$

$$(v) 21\text{cm} = 200000\text{cm}$$

$$(xi) 7.07\text{km} = 707000\text{cm}$$

$$(xiii) 1.99\text{m} = 199\text{cm}$$

$$(xix) 4.02\text{m} = 402\text{cm}$$

**Q3: Change the following into millimetres.**

- (i)  $25\text{cm} = 250\text{mm}$  (x 100)  
(vi)  $64.8\text{cm} = 648\text{mm}$  (x 100)  
(x)  $3.9\text{m} = 3900\text{mm}$  (x 1000)  
(xv)  $4\text{km} = 4000000\text{mm}$  (x 1000)

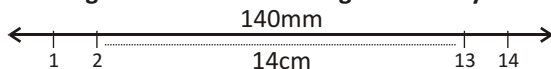
**Q4: Write in the form of decimals**

- (i)  $4\text{m } 32\text{cm}$  (ii)  $5\text{km } 22\text{m}$  (v)  $10\text{km } 150\text{cm}$   
 $\Rightarrow 4\text{m} + 0.32\text{m}$   $\Rightarrow 5\text{km} + 0.22\text{km}$   $\Rightarrow 10\text{km} + 0.0015\text{km}$   
 $\Rightarrow 4.32\text{m}$   $\Rightarrow 5.022\text{km}$   $\Rightarrow 10.00\text{km}$
- (vi)  $4\text{km } 2\text{mm}$  (ix)  $5\text{kg } 20\text{g}$  (x)  $10\text{g } 15\text{mg}$   
 $\Rightarrow 4\text{km} + 0.2\text{mm}$   $\Rightarrow 5\text{kg} + 0.02\text{kg}$   $\Rightarrow 10\text{g} + 0.015\text{g}$   
 $\Rightarrow 4.2\text{km}$   $\Rightarrow 5.02\text{kg}$   $\Rightarrow 10.015\text{g}$
- (xiv)  $2\text{L } 15\text{mL}$   
 $2\text{L} + 0.015\text{L}$   
 $2.015\text{L}$

**Q5: Express as kilograms & grams**

- (i)  $2.56\text{kg}$  (v)  $1.07\text{kg}$  (xii)  $5.7\text{kg}$   
 $\Rightarrow 2.56 \times 1000$   $\Rightarrow 1.07 + 1000$   $\Rightarrow 5.7 \times 1000$   
 $\Rightarrow 2560\text{ grams}$   $\Rightarrow 1070\text{ grams}$   $\Rightarrow 5700\text{ grams}$

**Q6: Draw a segment that is 14cm long. How many mm long is it?**



**Q7: Complete the following table:**

	m	cm	mm
(v)	1.8	180	1800
	10	1,000	10,000

**Q8: Which is larger 5.45km or 4900m**

$\Rightarrow 5.45\text{km}$  is larger because  
 $5.45$  is equals to  $5450\text{m}$

**Q9: Change into ml**

- (i)  $2.5\text{L}$  (iv)  $12.7\text{L}$  (viii)  $6.4\text{L}$   
 $\Rightarrow 2.5 \times 1000$   $\Rightarrow 12.7 \times 1000$   $\Rightarrow 6.4 \times 1000$   
 $\Rightarrow 2500\text{ml}$   $\Rightarrow 12700\text{ml}$   $\Rightarrow 6400\text{ml}$

**Q10: Doctor has advised Ali to take 1.5ml of medicine 2 times every day for 5 will he take in 5 days.**

times days  
 $1.5\text{ml} \times 2 \times 5$   
 $\Rightarrow 15\text{ml}$

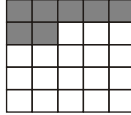
**Q11: Which unit would you use to measure the weight of the following: milligram, gram or kilogram?  
Consider the answers from book.**

## Fractions

### Exercise: 3.1

1. Draw diagrams to show the following fractions.

(i)  $\frac{1}{8}$  

(iv)  $\frac{7}{25}$  

(viii) 

2. Classify the following fractions as proper or improper.

(i)  $\frac{7}{16}$  Proper (denominator is greater)

(vii)  $\frac{13}{12}$  Improper (numerator is greater)

3. Express the improper fractions as mixed numbers and mixed numbers as improper fractions.

(i)  $4 \frac{1}{6}$

$$\Rightarrow 6 \times 4 = 24$$

$$\Rightarrow 24 + 1 = 25$$

improper fraction can be written as  $\frac{25}{6}$

(ii)  $\frac{7}{4}$

$$\Rightarrow \frac{4}{4} + \frac{3}{4} \text{ mixed fraction can be written as } 1 \frac{3}{4}$$

$$1 + \frac{3}{4} \text{ or } 1\frac{3}{4}$$

4. Write 3 equivalent fractions for each of the following fractions.

(i)  $\frac{2}{3}$

$$\Rightarrow \frac{2}{3} \times \frac{2}{2} = \frac{4}{6} \text{ first equivalent}$$

$$\Rightarrow \frac{2}{3} \times \frac{3}{3} = \frac{6}{9} \text{ second equivalent}$$

$$\Rightarrow \frac{2}{3} \times \frac{4}{4} = \frac{8}{12} \text{ third equivalent}$$

(viii)  $\frac{8}{3}$

$$\Rightarrow \frac{8}{3} \times \frac{2}{2} = \frac{16}{6}$$

$$\Rightarrow \frac{8}{3} \times \frac{3}{3} = \frac{24}{9}$$

$$\Rightarrow \frac{8}{3} \times \frac{4}{4} = \frac{32}{12}$$

**5. Reduce the following fractions to lowest term.**

$$(i) \frac{8^4}{24_{12}} \Rightarrow \frac{4^2}{12_6} \Rightarrow \frac{2^1}{6_3} \Rightarrow \frac{1}{3}$$

$$(v) \frac{28^{14}}{36_{18}} \Rightarrow \frac{14^7}{18_9} \Rightarrow \frac{7}{9}$$

$$(x) \frac{20^{10}}{58_{29}} = \frac{10}{29}$$

**6. Find the fraction which has**

(i) 4 as denominator and it is equivalent to  $\frac{6}{8}$

$$\frac{6}{8} \div \frac{2}{2} = \frac{3}{4}$$

(ii) 5 as numerator & it is equivalent to  $\frac{1}{3}$

$$\frac{1}{3} \times \frac{5}{5} = \frac{5}{15}$$

(iii) 12 as denominator & it is equivalent to  $\frac{15}{36}$

$$\frac{15}{36} \div \frac{3}{3} = \frac{5}{12}$$

**Exercise: 3.2**

**1. Simplify**

$$(i) \frac{5}{6} + \frac{11}{12}$$

$$\begin{array}{r|l} 2 & 6, 12 \\ \hline 2 & 3, 6 \\ 3 & 3, 3 \\ \hline & 1, 1 \end{array}$$

LCM is 12

Change  $\frac{5}{6}$  to equivalent fraction with denominator 12

$$\frac{5}{6} \Rightarrow \frac{10}{12} \Rightarrow \frac{10}{12} + \frac{11}{12} \Rightarrow \frac{21}{12}$$

$$(vi) 6\frac{3}{8} + 7\frac{1}{6}$$

first change mixed fraction to improper fraction

$$\frac{51}{8} + \frac{43}{6}$$

$$\begin{array}{r|l} 2 & 8, 6 \\ \hline 2 & 4, 3 \\ 2 & 2, 3 \\ 3 & 1, 3 \\ \hline & 1, 1 \end{array}$$

LCM is 24 change fractions to equivalent fraction with 24 as denominator

$$\frac{153}{24} + \frac{172}{24}$$

$$\frac{325}{24} \text{ or } 13\frac{13}{24}$$

$$(xv) 1\frac{9}{12} + \frac{5}{6}$$

$$\frac{21}{12} + \frac{5}{6}$$

$$\begin{array}{r|l} 2 & 12, 6 \\ \hline 2 & 6, 3 \\ 3 & 3, 1 \\ \hline & 1, 1 \end{array}$$

LCM 12 change fractions to equivalent fraction with denominator 12

$$\frac{21}{12} + \frac{10}{12}$$

$$\frac{31}{12} \text{ or } 2\frac{7}{12}$$

## 2. Simplify the following fractions:

$$(i) \frac{3}{5} - \frac{2}{7}$$

$$\begin{array}{r|l} 5 & 5, 7 \\ \hline 7 & 1, 7 \\ \hline & 1, 1 \end{array}$$

LCM is 35 change the fractions to equivalent fraction with with 35 as denominator

$$\frac{21}{35} - \frac{10}{35}$$

$$\frac{11}{35}$$

$$(v) \frac{4}{3} - \frac{1}{5}$$

$$\begin{array}{r|l} 3 & 3, 5 \\ \hline 5 & 1, 5 \\ \hline & 1, 1 \end{array}$$

LCM is 15 change the fractions to equivalent fraction with 15 as denominator.

$$\frac{20}{15} - \frac{3}{15}$$

$$= \frac{17}{15}$$

$$(ix) 9\frac{2}{3} - 4\frac{1}{2}$$

$$9\frac{29}{3} - \frac{9}{2}$$

$$\begin{array}{r|l} 2 & 3, 2 \\ \hline 3 & 3, 1 \\ \hline & 1, 1 \end{array}$$

LCM is 6 change the fractions to the equivalent fraction with 6 as denominator.

$$\frac{58}{6} - \frac{27}{6}$$

$$= \frac{31}{6}$$

$$(xv) 16 - 5\frac{7}{8}$$

$$\frac{16}{1} - \frac{47}{8}$$

$$\begin{array}{r|l} 2 & 1, 8 \\ \hline 2 & 1, 4 \\ \hline 2 & 1, 2 \\ \hline & 1, 1 \end{array}$$

LCM is 8 change the fractions to the equivalent fraction with 8 as denominator.

$$\begin{aligned}\frac{128}{8} - \frac{47}{8} \\ = \frac{81}{8}\end{aligned}$$

3. Mother used  $\frac{7}{12}$  of a dozen eggs to make breakfast and  $\frac{8}{12}$  of a dozen for supper. How many dozen egg did she use?

Solution:

$$\begin{aligned}\frac{7}{12} + \frac{8}{12} \\ = \frac{15}{12} \text{ or } 1\frac{3}{12}\end{aligned}$$

4. It takes  $2\frac{1}{2}$  hours to travel from town A to town B and  $\frac{3}{4}$  of an hour to travel from B to town C. How much total time will be consumed in travelling from town A to town C?

Solution:

$$\text{A to B} = 2\frac{1}{2}$$

$$\text{B to C} = \frac{3}{4}$$

$$\begin{aligned}\text{A to B} + \text{A to B} \\ \frac{5}{2} + \frac{3}{4}\end{aligned}$$

LCM is 4 change the fractions to the equivalent fraction with denominator 4

$$\begin{aligned}\frac{10}{4} + \frac{3}{4} \\ \Rightarrow \frac{13}{4} \text{ or } 3\frac{1}{4}\end{aligned}$$

5. The lead in a pencil is 5cm long. After pieces of  $3\frac{1}{8}$  cm and  $1\frac{3}{4}$  cm are broken off, how long is the lead left in the pencil?

Solution:

$$\text{Previous size} = 5\text{cm}$$

$$\text{broken off 1} = 3\frac{1}{8}$$

$$\text{broken off 2} = 1\frac{3}{4}$$

$$\text{Current size} = \text{previous size} - b_1 - b_2$$

$$\begin{aligned}\text{Current size} &= 5 - 3\frac{1}{8} - 1\frac{3}{4} \\ &= \frac{5}{1} - 3\frac{25}{8} - \frac{7}{4}\end{aligned}$$

LCM is 8 change the fractions to the equivalent fraction with 8 as denominator

$$\begin{aligned}
 &= \frac{40}{8} - \frac{25}{8} - \frac{14}{8} \\
 &= \frac{40 - 25 - 14}{8} \\
 &= \frac{1}{8}
 \end{aligned}$$

7. A trip takes 6 hours to complete. After travelling  $1\frac{3}{8}$  hours and  $2\frac{1}{3}$  hours, how much time is needed to complete the trip?

Solution:

$$\begin{aligned}
 &= \frac{6}{1} - 1\frac{3}{8} - 2\frac{1}{3} \\
 &\quad \text{or} \\
 &= \frac{6}{1} - \frac{11}{8} - \frac{7}{3}
 \end{aligned}$$

$$\begin{array}{r|l}
 2 & 8, 3, 1 \\
 \hline
 2 & 4, 3, 1 \\
 \hline
 2 & 2, 3, 1 \\
 \hline
 3 & 1, 3, 1 \\
 \hline
 & 1 \quad 1 \quad 1
 \end{array}$$

LCM is 24 change fractions to equivalent fractions with 24 as denominator.

$$\begin{aligned}
 &= \frac{144}{24} - \frac{33}{24} - \frac{56}{24} \\
 &= \frac{55}{24}
 \end{aligned}$$

8. A piece of mutton weighing  $14\frac{1}{2}$  kilograms was cut into two pieces. If one piece weighs  $8\frac{1}{4}$  kilograms, how much does the other piece weigh?

Solution:

$$= 14\frac{1}{2} - 8\frac{1}{4}$$

$$\begin{array}{r|l}
 2 & 2, 4 \\
 \hline
 2 & 1, 2 \\
 \hline
 & 1, 1
 \end{array}$$

LCM is 4 change the fraction to equivalent fractions with denominator '4'.

$$\begin{aligned}
 &= \frac{58}{4} - \frac{33}{4} \\
 &= \frac{58 - 33}{4} \\
 &= \frac{25}{4} \text{ or } 6\frac{1}{4}
 \end{aligned}$$

9. Each side of an equilateral triangle is  $3\frac{3}{4}$  cm long. What is the perimeter of the triangle?

Solution:

$$\begin{aligned}
 &= 3\frac{3}{4} \Rightarrow \frac{15}{4} \\
 &= \frac{15}{4} + \frac{15}{4} + \frac{15}{4} \\
 &= \frac{45}{4}
 \end{aligned}$$

10. Mother requires  $\frac{5}{8}$  of a kg of hunter beef to make sandwiches. She has  $\frac{2}{4}$  of a kg. How much more hunter beef does she need?

Solution:

$$= \frac{5}{8} - \frac{2}{4}$$

LCM is 8 change the fraction to equivalent fraction with 8 as denominator.

$$= \frac{5}{8} - \frac{4}{8}$$

$$= \frac{1}{8}$$

11. Find the sum of the fractions in each row, column and diagonal.

Solution:

$$R_1 = \frac{4}{3} + \frac{1}{6} + \frac{1}{1}$$

LCM is 6

$$R_1 = \frac{8}{6} + \frac{1}{6} + \frac{6}{6}$$

$$R_1 = \frac{15}{6}$$

$$C_1 = \frac{4}{3} + \frac{1}{2} + \frac{2}{3}$$

LCM is 6

$$C_1 = \frac{8}{6} + \frac{3}{6} + \frac{4}{6}$$

$$C_1 = \frac{15}{6}$$

$$D_1 = \frac{4}{3} + \frac{5}{6} + \frac{1}{3}$$

LCM is 6

$$D_1 = \frac{8}{6} + \frac{5}{6} + \frac{2}{6}$$

$$D_1 = \frac{15}{6}$$

### Exercise: 3.3

Write  $<$ ,  $>$  or  $=$  between each pair of fractions. Remember to change them to equivalent fractions.

(i)  $\frac{1}{2} \square \frac{3}{7}$

one way com way comparing fraction is to change them to common denominator.

LCM is 14 change the above fraction to equivalent fractions with 14 as denominator.

$$\frac{7}{14} \square \frac{6}{14}$$

$$\frac{1}{2} \square \frac{3}{7}$$

$$\frac{15}{7} \square \frac{62}{49}$$

$$\begin{array}{r|l} 2 & 2, 7 \\ \hline 7 & 1, 7 \\ & 1 \end{array}$$

LCM is 49 change the fraction to equivalent fraction with common denominator 49

$$\frac{105}{49} \square \frac{62}{49}$$

hence  $\frac{15}{7} \square \frac{62}{49}$

$$\begin{array}{r|l} 2 & 2, 7 \\ \hline 7 & 1, 7 \\ & 1 \end{array}$$



## Exercise: 3.4

1. Simplify the following fractions.

$$(i) \frac{3}{7} \times \frac{5}{6}$$

$$\overset{1}{\cancel{3}} \frac{5}{\cancel{6}_2}$$

Now, multiply numerator with numerator and denominator with denominator

$$= \frac{1 \times 5}{7 \times 2} \Rightarrow \frac{5}{14}$$

$$(v) 5 \times \frac{3}{10}$$

$$= \frac{5}{1} \times \frac{3}{10}$$

$$= \frac{5 \times 3}{1 \times 10}$$

$$= \overset{3}{\cancel{15}} \Rightarrow \frac{3}{2}$$

$$(xii) \frac{3}{10} \times 2 \frac{1}{2}$$

$$= \frac{7}{8} \times \frac{5}{2}$$

$$= \frac{7 \times 5}{8 \times 2}$$

$$= \frac{35}{16}$$

$$(xviii) 4 \frac{1}{2} \times \frac{16}{27}$$

$$= \overset{1}{\cancel{9}} \times \overset{8}{\cancel{16}} \frac{16}{27}_3$$

$$= \frac{1 \times 8}{1 \times 3}$$

$$= \frac{8}{3}$$

2. A worker makes  $\frac{1}{2}$  of a basket in an hour. How many baskets will he make in 8 hours?

$$\frac{1}{2} \times 8$$

$$= \frac{1}{\cancel{2}} \times \frac{\cancel{8}^4}{1}$$

$$= \frac{1 \times 4}{1 \times 1}$$

$$= \frac{4}{1} \text{ or } 4 \text{ baskets}$$

3. A rectangle is  $2\frac{1}{2}$  cm wide and  $5\frac{3}{4}$  cm long. What is its area? (Hint  $A = L \times W$ )

$$A = L \times W$$

$$A = 5\frac{3}{4} \times 2\frac{1}{2}$$

$$A = \frac{23}{4} \times \frac{5}{2}$$

$$A = \frac{115}{8} \text{ cm}$$

4. A certain recipe for a cake requires  $2\frac{3}{4}$  cups of flour. How much flour is required for 4 such cakes?

$$2\frac{3}{4} \times 4$$

$$= \frac{11}{4} \times \frac{4}{1}$$

$$= \frac{11 \times 1}{1 \times 1} = \frac{11}{1} \text{ or } 11$$

5. Apples cost  $22\frac{3}{4}$  rupees per kilogram. How much would  $2\frac{1}{2}$  kilograms of apple cost?

$$\begin{aligned} & 22\frac{3}{4} \times 2\frac{1}{2} \\ &= \frac{91}{4} \times \frac{5}{2} \\ &= \frac{455}{8} \end{aligned}$$

6. There are 12 months in a year. How much months are there in  $5\frac{1}{2}$  years?

$$\begin{aligned} & 12 \times 5\frac{1}{2} \\ &= \frac{12}{1} \times \frac{11}{2} \\ &= \frac{6 \times 11}{1 \times 1} \\ &= \frac{66}{1} \text{ or } 66 \end{aligned}$$

7. How many minutes are there in  $\frac{1}{6}$  of an hour?

$$\begin{aligned} & 60 \times \frac{1}{6} \\ &= \frac{60}{1} \times \frac{1}{6} \\ &= \frac{10 \times 1}{1 \times 1} = \frac{10}{1} \text{ or } 10 \end{aligned}$$

### Exercise: 3.5

1. Give reciprocals of:

(i)  $7 \Rightarrow \frac{1}{7}$

(iii)  $1\frac{1}{4}$

$$= \frac{5}{4} \Rightarrow \frac{4}{5}$$

(viii)  $\frac{5}{8}$

$$= \frac{5}{8} \Rightarrow \frac{8}{5}$$

2. Simplify:

(i)  $\frac{5}{6} \div \frac{3}{4}$

$$= \frac{5}{6} \times \frac{4}{3}$$

$$= \frac{10}{9}$$

(iii)  $3\frac{1}{2} \div 1\frac{1}{2}$

$$= \frac{7}{2} \div \frac{3}{2}$$

$$= \frac{7}{2} \times \frac{2}{3}$$

$$= \frac{7}{3}$$

$$\begin{aligned}
 \text{(ix)} \quad 5 \frac{1}{2} \div 3 \\
 &= \frac{11}{2} \div \frac{3}{1} \\
 &= \frac{11}{2} \times \frac{1}{3} \\
 &= \frac{11}{6}
 \end{aligned}$$

$$\begin{aligned}
 \text{(xix)} \quad \frac{11}{12} \div \frac{11}{18} \\
 &= \frac{\overset{1}{\cancel{11}}}{\underset{2}{12}} \times \frac{\overset{3}{\cancel{18}}}{\underset{1}{11}} \\
 &= \frac{1 \times 3}{2 \times 1} \Rightarrow \frac{3}{2}
 \end{aligned}$$

3. Divide a  $7 \frac{1}{2}$  cm long string into 5 pieces. What is the length of each piece?

$$\begin{aligned}
 7 \frac{1}{2} \div 5 \\
 &= \frac{15}{2} \div \frac{5}{1} \\
 &= \frac{\overset{3}{\cancel{15}}}{2} \times \frac{1}{\underset{1}{\cancel{5}}} \\
 &= \frac{3}{2}
 \end{aligned}$$

4. The product of two numbers is  $\frac{5}{4}$ . If one of the numbers is  $\frac{1}{2}$ , what is the other number?

$$\begin{aligned}
 \frac{5}{4} \div \frac{1}{2} \\
 &= \frac{\overset{2}{\cancel{5}}}{\underset{2}{4}} \times \frac{\overset{1}{\cancel{2}}}{1} \\
 &= \frac{5 \times 1}{2 \times 1} \Rightarrow \frac{5}{2}
 \end{aligned}$$

5. Divide a  $5 \frac{1}{2}$  kg weight into 4 equal weights.

$$\begin{aligned}
 5 \frac{1}{2} \div 4 \\
 &= \frac{11}{2} \div \frac{4}{1} \\
 &= \frac{11}{2} \times \frac{1}{4} \Rightarrow \frac{11}{8}
 \end{aligned}$$

6. The perimeter of a square is  $14 \frac{1}{2}$  meters. What is the length of the side of the square?

$$\begin{aligned}
 14 \frac{1}{2} \div 4 \\
 &= \frac{29}{2} \div \frac{4}{1} \\
 &= \frac{29}{2} \times \frac{1}{4} \\
 &= \frac{29}{8}
 \end{aligned}$$

7. 93 divided by a number yields  $7\frac{3}{4}$  meters. What is the number?

$$93 \div 7\frac{3}{4}$$

$$= 93 \div \frac{31}{4}$$

$$= \frac{\overset{3}{93}}{1} \times \frac{4}{\underset{1}{31}}$$

$$= \frac{3 \times 4}{1 \times 1}$$

$$= 12$$

93 was divided by 12 to yield  $7\frac{3}{4}$

8.  $2\frac{1}{2}$  yards of cloth are required to make a dress. How many dresses can be made from 30 yards of cloth?

$$30 \div 2\frac{1}{2}$$

$$= \frac{30}{1} \div \frac{5}{2}$$

$$= \frac{\overset{6}{30}}{1} \times \frac{2}{\underset{1}{5}}$$

$$= \frac{12}{1} \text{ or } 12$$

9. The product of two numbers is 1. If one of the numbers is  $2\frac{1}{8}$ , what is the other number?

$$1 \div 2\frac{1}{8}$$

$$= \frac{1}{1} \div \frac{17}{8}$$

$$= \frac{1}{1} \times \frac{8}{17}$$

$$= \frac{8}{17}$$

### Exercise: 3.6

1. Find:

(i)  $\frac{5}{8}$  of 24

$$= \frac{5}{8} \times 24$$

$$= 15$$

(v)  $\frac{6}{7}$  of 56

$$= \frac{6}{7} \times 56$$

$$= 48$$

(x)  $\frac{7}{4}$  of 100

$$= \frac{7}{4} \times 100$$

$$= 175$$

(xii)  $\frac{7}{10}$  of 250

$$= \frac{7}{10} \times 250$$

$$= 175$$

## 2. Find the following

$$\begin{aligned} \text{(i)} \quad 140 \div \frac{7}{3} \\ = \cancel{140}^{\cancel{20}} \times \frac{3}{\cancel{7}_1} \\ = 60 \end{aligned}$$

$$\begin{aligned} \text{(xii)} \quad 200 \div \frac{2}{5} \\ = \cancel{200}^{\cancel{100}} \times \frac{5}{\cancel{2}_1} \\ = 500 \end{aligned}$$

$$\begin{aligned} \text{(v)} \quad 45 \div \frac{3}{2} \\ = \cancel{45}^{\cancel{15}} \times \frac{2}{\cancel{3}_1} \\ = 30 \end{aligned}$$

3. A man saves  $\frac{1}{6}$  of his income every month. If he earns 1500 rupees per month, how much does he save every month?

$$\begin{aligned} \frac{1}{6} \text{ of } 1500 \\ = \frac{1}{\cancel{6}_1} \times \cancel{1500}^{\cancel{250}} \end{aligned}$$

4. A man drove 90 kilometer and thus completed  $\frac{3}{4}$  of his trip. How many kilometer was the total trip?

$$\begin{aligned} 90 \div \frac{3}{4} \\ = \cancel{90}^{\cancel{30}} \times \frac{4}{\cancel{3}_1} \\ = 120 \text{ Km} \end{aligned}$$

5. On a rainy day, 16 students i.e.  $\frac{1}{4}$  of the students of a class were absent. How many total students are there in the class?

$$\begin{aligned} 16 \div \frac{1}{4} \\ = 16 \times \frac{4}{1} \\ = 64 \text{ students} \end{aligned}$$

6. A hockey team won  $\frac{4}{9}$  of the matches that it played. If the team won 20 games, how many games did it play?

$$\begin{aligned} 20 \div \frac{4}{9} \\ = \cancel{20}^{\cancel{5}} \times \frac{9}{\cancel{4}_1} \\ = 45 \end{aligned}$$

7. Ahmed had to sell 160 tickets for a music show. He could sell only  $\frac{1}{8}$  of them. How many tickets has he sold?

$$\begin{aligned} & \frac{1}{8} \text{ of } 160 \\ & = \frac{1}{\cancel{8}} \times 1\cancel{6}0^{20} \\ & = 20 \end{aligned}$$

8. Kiran has read  $\frac{3}{5}$  of a story-book. If the book has 200 pages, how many pages has she read?

$$\begin{aligned} & \frac{3}{5} \text{ of } 200 \\ & = \frac{3}{\cancel{5}} \times 2\cancel{0}0^{40} \\ & = 120 \text{ pages} \end{aligned}$$

9. Ali had 552 rupees. He spent  $\frac{3}{5}$  of the money. How many rupees has he spent?

$$\begin{aligned} & \frac{1}{8} \text{ of } 552 \\ & = \frac{1}{\cancel{8}} \times 5\cancel{5}2^{69} \\ & = 69 \text{ Rupees} \end{aligned}$$

10. Omar can jump a distance of  $6\frac{1}{8}$  feet, whereas Ali can jump to only  $3\frac{1}{2}$  feet. What fraction of Omar's jump is to Ali's jump?

$$\begin{aligned} & 6\frac{1}{8} \div 3\frac{1}{2} \\ & = \frac{\cancel{7}4\cancel{9}}{\cancel{4}8} \times \frac{\cancel{2}^1}{\cancel{7}_1} \\ & = \frac{7}{4} \end{aligned}$$

### Exercise: 3.7

1. From the chart, what decimal numeral represents the same numbers as:

See the answers from answer book.

2. What fractional numeral represents the same number as:

(i) 0.3

$$= \frac{3}{10}$$

(v) 1.7

$$= \frac{17}{10} \text{ or } 1\frac{7}{10}$$

**3. Find the product and express as a decimal fraction:**

$$\begin{aligned} \text{(i)} \quad & \frac{2}{10} \times \frac{1}{10} \\ & = \frac{2}{100} \\ & = 0.02 \end{aligned}$$

$$\begin{aligned} \text{(ii)} \quad & \frac{4}{10} \times \frac{7}{10} \\ & = \frac{28}{100} \\ & = 0.28 \end{aligned}$$

$$\begin{aligned} \text{(iii)} \quad & \frac{8}{10} \times \frac{11}{10} \\ & = \frac{88}{100} \\ & = 0.88 \end{aligned}$$

$$\begin{aligned} \text{(iv)} \quad & \frac{9}{10} \times \frac{14}{10} \\ & = \frac{126}{100} \\ & = 1.26 \end{aligned}$$

**Exercise: 3.8**

**1. Complete this table. It will be useful for future reference.**

Fraction	Decimal	Fraction	Decimal
$\frac{1}{4}$	0.25	$\frac{3}{5}$	0.6
$\frac{1}{2}$	0.5	$\frac{4}{8}$	0.8
$\frac{3}{4}$	0.75	$\frac{1}{5}$	0.2
$1 \frac{1}{4}$	1.25	$1 \frac{1}{8}$	1.125
$\frac{1}{6}$	0.16	$\frac{3}{8}$	0.375
$\frac{2}{5}$	0.4	$\frac{5}{8}$	0.625

**2. Which is greater?**

(i)  $\frac{1}{4}$  or 0.125

Change fraction into decimal.

$$\frac{1}{4} = 0.25$$

Now compare 0.25 with 0.125 here

0.25 is greater means  $\frac{1}{4}$  is greater

(iv)  $1 \frac{1}{4}$  or 1.2

$$1 \frac{1}{4} = 1.25$$

Compare 1.25 and 1.2 here, 1.25 is greater means  $1 \frac{1}{4}$  is greater.

**3. Convert the following decimals to fraction. The answer should be in lowest terms.**

(i) 0.4

**Step one:** remove decimal and put 1 in denominator

$$\frac{0.4}{1}$$

**Step two:** put one 0 after 1 because there is one number after decimal point.

$$\frac{4}{10}$$

**Step three:** change into lowest terms.

$$\frac{\overset{2}{\cancel{4}}}{\underset{5}{\cancel{10}}}$$

$$\Rightarrow \frac{2}{5} \text{ Answer}$$

(viii) 4.2

**Step one:** remove decimal and put 1 in denominator

$$\frac{4.2}{1}$$

**Step two:** put one 0 after 1 because there is one number after decimal point.

$$\frac{42}{10}$$

**Step three:** change into lowest terms.

$$\frac{\overset{21}{\cancel{42}}}{\underset{5}{\cancel{10}}}$$

$$\Rightarrow \frac{21}{5} \text{ Answer}$$

**4. Convert the following fractions to decimals.**

(i)  $\frac{9}{25}$

$$\begin{array}{r} 25 \overline{) 90} \phantom{0} \\ \underline{75} \phantom{0} \\ 150 \\ \underline{150} \\ \text{xxx} \end{array} 0.36$$

= 0.36

(v)  $\frac{1.24}{0.2} \Rightarrow \frac{1.24}{0.20}$

$$\begin{array}{r} 20 \overline{) 124} \phantom{0} \\ \underline{120} \phantom{0} \\ 4 \\ \underline{4} \\ \text{x} \end{array} 6.2$$

= 6.2 Answer

**5. A rod is 10m long. If two pieces of 4.5m and  $2\frac{3}{8}$  m are cut, what is the length of rod left?**

**Solution:**

Convert fraction into decimal

$$2\frac{3}{8} = 2.0375$$



Now,

$$10 - 4.5 - 2.375$$

$$\begin{array}{r} 10.000 \\ - 4.5 \\ - 2.375 \\ \hline 3.25 \end{array}$$

6. The sides of a triangle measure 3.5cm,  $4\frac{1}{8}$  cm and  $5\frac{3}{8}$  cm. Find its perimeter.  
(Hint perimeter = side + side)

**Solution:**

Perimeter = addition of all sides there

$$\text{Perimeter} = 3.5 + 4\frac{1}{8} + 5\frac{3}{8}$$

$$\text{Perimeter} = 3.5 + 4.125 + 5.375$$

$$\text{Perimeter} = 13$$

7. The sum of three numbers  $x$ , 4.6 and  $8\frac{3}{4}$  is 20. What is  $x$ ?

**Solution:**

$$x + 4.6 + 8\frac{3}{8} = 20$$

$$x + 4.6 + 8.75 = 20$$

$$x = 20 - 13.36 \Rightarrow x = 6.65$$

8. A cloth costs 14.5 rupees per meter. What will be the cost of  $2\frac{1}{2}$  meters?

**Solution:**

$$14.5 \times 2\frac{1}{2}$$

$$= 14.5 \times 2.5$$

$$\begin{array}{r} 14.5 \\ \times 2.5 \\ \hline 725 \\ - 2900 \\ \hline 36.25 \end{array}$$

9. A car covered a distance of 52.4 kilometers in 1 hour. How much distance in  $4\frac{1}{2}$  hours.

**Solution:**

$$52.4 \times 4\frac{1}{2}$$

$$= 52.4 \times 4.5$$

$$= 235.80$$

10. Divide Rs. 427.6 among 4 persons.

**Solution:**

$$427.6 \div 4$$

$$\begin{array}{r}
 4 \overline{) 4276} \quad 1069 \\
 \underline{4 \downarrow \downarrow \downarrow} \\
 027 \downarrow \\
 \underline{24 \downarrow} \\
 36 \\
 \underline{36} \\
 00
 \end{array}$$

(When we bring two numbers down together we have to put zero on the top)

$$427.6 \div 4 = 106.9$$

11. The product of two numbers  $x$  and  $2.4$  is  $22\frac{3}{4}$ . What is  $x$ ?

Solution:

$$\begin{aligned}
 x \times 2.4 &= 22\frac{3}{4} & \text{or} & \quad x \times 2.4 = 22.75 \\
 & & & \quad x = 22.75 \div 2.4 \\
 & & & \quad x = 9.48
 \end{aligned}$$

12. Simplify: (first change fractions to decimals)

(i)  $1\frac{1}{4} + 0.1$

$$\begin{aligned}
 &= 1.25 + 0.1 \\
 &= \quad 1.25 \\
 &\quad + 0.1 \\
 &\quad \underline{\quad 0.1} \\
 &\quad \underline{1.35}
 \end{aligned}$$

$$= 1.35$$

(v)  $15.24 + 9\frac{1}{2}$

$$\begin{aligned}
 &= 15.24 + 9.5 \\
 &= \quad 15.24 \\
 &\quad + 9.5 \\
 &\quad \underline{\quad 9.5} \\
 &\quad \underline{24.74}
 \end{aligned}$$

$$= 24.74$$

(ix)  $20.25 \times \frac{1}{8}$

$$= 20.25 \times 0.125$$

$$\begin{array}{r}
 2025 \\
 \times 125 \\
 \hline
 10105 \\
 4050x \\
 \hline
 2025xx \\
 \hline
 253105
 \end{array}$$

(decimal point before two numbers)  
(decimal point before three number)

$$20.25 \times 0.125 = 2.53105 \quad (\text{decimal point after five numbers})$$

(xii)  $54.49 \div \frac{2}{5}$

$$= 54.49 \div 0.4$$

$$\begin{array}{r}
 4 \overline{) 5449} \quad 136.225 \\
 \underline{4 \downarrow \downarrow \downarrow} \\
 14 \downarrow \\
 \underline{12 \downarrow} \\
 24 \\
 \underline{24} \\
 9 \\
 \underline{8} \\
 10 \\
 \underline{8} \\
 20 \\
 \underline{20} \\
 00
 \end{array}$$

136.225  
(decimal point before three digits)

13. Ahmed bought a ball for 27.75 rupees and after a month sold it for  $\frac{3}{8}$  th of its original price. For how many rupees did he sell the ball?

**Solution:**

$$\frac{3}{8} \text{ of } 27.75$$

$$\frac{3}{8} \times 27.75$$

$$0.375 \times 27.75$$

$$\begin{array}{r} 2775 \\ 375 \\ \hline 13875 \\ 19425 \times \\ 8325 \times \times \\ \hline 1040625 \end{array}$$

10.40625 (decimal point before five digits)

14. Mutton sells at 102.50 rupees per kilogram. What is the cost of  $2\frac{1}{2}$  kilogram mutton?

**Solution:**

$$102.50 \times 2\frac{1}{2}$$

$$= 102.50 \times 2.5$$

$$\begin{array}{r} 10250 \\ 25 \\ \hline 51250 \\ + 20500 \times \\ \hline 256250 \end{array}$$

$$= 256.250$$

15. In a sale a shirt that originally costs 158.25 rupees is available at  $\frac{1}{4}$  of its price. What is its new price?

**Solution:**

$$\frac{1}{4} \text{ of } 158.25$$

$$= 0.25 \times 158.25 \quad \Rightarrow$$

$$\begin{array}{r} 15825 \\ \times 25 \\ \hline 79125 \\ + 31650 \times \\ \hline 395625 \end{array}$$

$$= 39.5625$$

### Exercise: 3.9

1. Write each of these as percentages.

(i)  $\frac{4}{5}$   
 $= \frac{4}{5} \times 100$

Method 1  
 (convert fraction into decimal)  
 $= 0.8 \times 100$   
 $= 80\%$

(v)  $\frac{1}{4}$   
 $= \frac{1}{4} \times 100$

Method 2  
 (Multiply numerator with 100)  
 $= \frac{100}{4} \Rightarrow 25\%$

$$\begin{aligned}
 \text{(ix)} \quad & \frac{32}{25} \\
 &= \frac{32}{25} \times 100 \\
 &= \frac{3200}{25} \\
 &= 128\%
 \end{aligned}$$

$$\begin{aligned}
 \text{(xiii)} \quad & \frac{12}{21} \\
 &= \frac{12}{21} \times 100 \\
 &= 57.14\%
 \end{aligned}$$

2. Write each of these percentages as fraction reduced to its simplest form.

$$\begin{aligned}
 \text{(i)} \quad & 34\% \\
 &= \frac{34}{100} \\
 &\text{reduce to lowest fraction} \\
 &= \frac{17}{50}
 \end{aligned}$$

$$\begin{aligned}
 \text{(v)} \quad & 24\% \\
 &= \frac{24}{100} \\
 &= \frac{6}{25} \quad \text{Lowest term}
 \end{aligned}$$

$$\begin{aligned}
 \text{(ix)} \quad & 175\% \\
 &= \frac{175}{100} \\
 &= \frac{7}{4} \quad \text{Lowest term}
 \end{aligned}$$

**Fun Time**

See in answers given in text book.

## Chapter 4

### Factors and Multiples

#### Exercise: 4.1

1. Find all the factors of:

$$\begin{aligned}
 \text{(i)} \quad & 50 \\
 & 1, 2, 5, 10, 25, 50
 \end{aligned}$$

**Note:** → 1 is the factor of all  
 →  $2 \times 5 = 10$   
 →  $5 \times 5 = 25$   
 →  $2 \times 5 \times 5 = 50$

$$\begin{array}{r|l}
 2 & 50 \\
 5 & 25 \\
 5 & 5 \\
 & 1
 \end{array}$$

$$\begin{aligned}
 \text{(i)} \quad & 63 \\
 & 1, 3, 7, 9, 21, 63
 \end{aligned}$$

$$\begin{array}{r|l}
 2 & 63 \\
 5 & 21 \\
 5 & 7
 \end{array}$$

- (i) 36  
1, 2, 3, 4, 6, 9

2	36
2	18
3	9
3	3
	1

- (ix) 54  
1, 2, 3, 6, 9, 18, 27, 54

2	54
3	27
3	9
3	3
	1

**2. Find the common factors of each set of numbers:**

- (i) 24 and 42  
factors of 24: 1, 2, 3, 4, 8, 6, 12, 24

2	24
2	12
2	6
3	3
2	1

factors of 42: 1, 2, 3, 6, 7, 14, 21, 42

2	42
3	21
7	7
	1

- (v) 15 and 45  
factors of 15: 1, 3, 5, 15

3	15
5	5
	1

factors of 45: 1, 3, 5, 9, 15, 45

3	45
3	15
5	5
	1

- (ix) 0 and 120  
No common factor because zero has no factor

- (xii) 16, 32, and 18  
factors of 16: 1, 2, 4, 8, 16

2	16
2	8
2	4
2	2
	1

factors of 32: 1, 2, 4, 8, 16, 32

$$\begin{array}{r|l} 2 & 32 \\ \hline 2 & 16 \\ \hline 2 & 8 \\ \hline 2 & 4 \\ \hline 2 & 2 \\ \hline & 1 \end{array}$$

factors of 18: 1, 2, 3, 6, 9, 18

$$\begin{array}{r|l} 2 & 18 \\ \hline 3 & 9 \\ \hline 3 & 3 \\ \hline & 1 \end{array}$$

**3. Find H.C.F of the following:**

(i) 8 and 12

factors of 8: 1, 2, 4, 8

factors of 12: 1, 2, 4, 6, 12

Common factors: 1, 2, 4

Highest common factor = 4

$$\begin{array}{r|l} 2 & 8 \\ \hline 2 & 4 \\ \hline 2 & 2 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 2 & 12 \\ \hline 2 & 6 \\ \hline 3 & 3 \\ \hline & 1 \end{array}$$

(vi) 22 and 33

factors of 22: 1, 2, 11, 22

factors of 33: 1, 3, 11, 33

Highest common factor = 11

$$\begin{array}{r|l} 2 & 22 \\ \hline 11 & 11 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 3 & 33 \\ \hline 11 & 11 \\ \hline & 1 \end{array}$$

(xii) 85 and 100

factors of 85: 1, 5, 17, 85

factors of 100: 1, 2, 4, 5, 10, 20, 25,  
50, 100

Highest common factor = 5

$$\begin{array}{r|l} 5 & 85 \\ \hline 17 & 17 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 2 & 100 \\ \hline 2 & 50 \\ \hline 5 & 25 \\ \hline 5 & 5 \\ \hline & 1 \end{array}$$

(xxi) 112, 12 and 136

factors of 112: 1, 2, 4, 8, 16, 14, 28,  
56, 112

factors of 100: 1, 2, 4, 5, 10, 20, 25,  
50, 100

factors of 12: 1, 2, 3, 4, 6, 12

factors of 136: 1, 2, 4, 8, 17, 34, 68

Highest common factor = 4

2		112
2		56
2		28
2		14
7		7
		1

2		136
2		68
2		34
17		17

## Exercise: 4.2

### 1. Find the HCF by Division method.

(i) 20 and 12

$$\begin{array}{r} 12 \overline{) 20} \quad 1 \\ \underline{12} \\ 8 \overline{) 12} \quad 1 \\ \underline{8} \\ 4 \overline{) 8} \quad 2 \\ \underline{4} \\ 8 \\ \underline{8} \\ x \end{array}$$

H.C.F = 4

(v) 50 and 63

$$\begin{array}{r} 50 \overline{) 63} \quad 1 \\ \underline{50} \\ 13 \overline{) 50} \quad 3 \\ \underline{39} \\ 11 \overline{) 39} \quad 3 \\ \underline{33} \\ 6 \overline{) 11} \quad 1 \\ \underline{6} \\ 5 \overline{) 6} \quad 1 \\ \underline{5} \\ 1 \overline{) 1} \quad 1 \\ \underline{1} \\ 1 \\ \underline{1} \\ x \end{array}$$

H.C.F = 1

(ix) 112 and 240

$$\begin{array}{r} 112 \overline{) 240} \quad 1 \\ \underline{224} \\ 16 \overline{) 112} \quad 7 \\ \underline{112} \\ 00 \end{array}$$

H.C.F = 16

(xv) 45, 75 and 100

$$\begin{array}{r}
 45 \overline{) 75} \quad 1 \\
 \underline{45} \\
 30 \overline{) 45} \quad 1 \\
 \underline{30} \\
 15 \overline{) 30} \quad 2 \\
 \underline{30} \\
 00
 \end{array}$$

$$\begin{array}{r}
 15 \overline{) 100} \quad 6 \\
 \underline{90} \\
 10 \overline{) 15} \quad 1 \\
 \underline{10} \\
 5 \overline{) 10} \quad 2 \\
 \underline{10} \\
 00
 \end{array}$$

H.C.F = 5

(xviii) 64, 78 and 96

$$\begin{array}{r}
 64 \overline{) 78} \quad 1 \\
 \underline{64} \\
 14 \overline{) 64} \quad 4 \\
 \underline{56} \\
 8 \overline{) 56} \quad 7 \\
 \underline{56} \\
 00
 \end{array}$$

$$\begin{array}{r}
 8 \overline{) 96} \quad 12 \\
 \underline{96} \\
 00
 \end{array}$$

H.C.F of 64, 78 and 96 is 8

### Exercise: 4.3

#### 1. Give the first 2 common multiples of:

(i) 9 and 12

Multiple of 9: 9, 18, 27, 36, 45, 54, 63, 72, 81, 91....

Multiple of 12: 12, 24, 36, 48, 60, 72, 84, 96, 108, 120....

First 2 common multiples are 36 and 72

(v) 5, and 15

Multiple of 5: 5, 10, 15, 20, 25, 30, 35....

Multiple of 15: 15, 30, 45, 60, 75, 90....

First two common multiples are 15 and 30

(ix) 5, 10, and 15

Multiple of 5: 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60....

Multiple of 10: 10, 20, 30, 40, 50, 60, 70, 80, 90, 100....

Multiple of 15: 15, 30, 45, 60, 75, 90, 105, 120....

First two common multiples are 30 and 60

#### 2. Find the LCM of:

(i) 12 and 18

LCM of 12 and 18 =  $2 \times 2 \times 3 \times 3 = 36$

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



(v) 8 and 12

$$\text{LCM of 8 and 12} = 2 \times 2 \times 3 = 24$$

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

(ix) 4, 6 and 12

$$\text{LCM of 4, 6 and 12} = 2 \times 2 \times 3 = 12$$

2	4, 6, 12
2	2, 3, 6
3	1, 3, 3
	1, 1, 1

## Exercise: 4.4

### 1. Find the L.C.M by division method.

(i) 12 and 16

$$\text{LCM of 12 and 16 is.}$$

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

2	12, 16
2	6, 8
2	3, 4
2	3, 2
3	3, 1
	1

(v) 10 and 25

$$\text{LCM of 10 and 25 is,}$$

$$2 \times 5 \times 5 = 50$$

2	10, 25
5	5, 25
5	1, 5
	1, 1

(viii) 20, 24 and 40

$$\text{LCM of 20, 24 and 40 is,}$$

$$2 \times 2 \times 2 \times 3 \times 5 = 140$$

2	20, 24, 40
2	10, 12, 20
2	5, 6, 10
3	5, 3, 5
5	5, 1, 5
	1, 1, 1

(xii) 9, 27 and 54

$$\text{LCM of 9, 27 and 54 is,}$$

$$2 \times 3 \times 3 \times 3 = 54$$

2	9, 27, 54
3	9, 27, 27
3	3, 9, 9
3	1, 3, 3
	1, 1, 1

## Exercise: 4.5

**1. Write whether true or false.**

Check answer Script in the end of text book.

**2. What number is a common factor of any pair of numbers?**

Answer: 1 is a common factor of any pair of number.

**3. What is the smallest one digit number that has exactly three factors?**

Answer: 4 is the smallest one digit number that has exactly three factors i.e; 1, 2 and 4.

**4. What is the smallest two digit number that has exactly three factors?**

Answer: 25 is the smallest two digit number that has exactly three factors i.e; 1, 5 and 25.

**5. If the three common multiples of two numbers are 12, 24, and 36 what are the numbers?**

Answer: The numbers are 4 and 6 lets see how

Multiple of 4: 4, 8, (12), 16, 20, (24), 28, 32, (36), 40

Multiple of 6: 6, (12), 18, 24, (30), 36, 42, (48)

**6. If the common factor of two numbers are 1, 2 and 4, what is the HCF of the two number.**

Answer: 4 is the highest common factor of the two number.

**7. What is the HCF of 18 and 21?**

**Solution:** By Division Method

$$\begin{array}{r} 18 \overline{) 21} \ 1 \\ \underline{18} \phantom{0} \\ 3 \overline{) 18} \ 6 \\ \underline{18} \\ 00 \end{array}$$

HCF = 3

**8. If 14 is a factor of any number then 2 and \_\_\_\_\_ are also the factors of that number.**

Answer: 7 because 14 is the multiple of 1, 2 and 7.

**9. One - digit numbers that have exactly three factors are 4 and \_\_\_\_\_**

Answer: 9 i.e; 1, 3 and 9

**10. What is the highest 2 digit number that has exactly two factors.**

Answer: 97 i.e; 1 and itself

**11. What is the highest 3-digit number that has exactly two factors.**

Answer: 999 i.e; 1 and itself

**12. What is the smallest 3-digit number that has exactly two factors?**

Answer: 101 i.e; 1 and itself



## Square and Square Root

### Exercise: 5.1

1. Find the values:

(i)  $7^2$

$$7^2 = 7 \times 7$$

$$= 49$$

(v)  $15^2$

$$15^2 = 15 \times 15$$

$$= 225$$

(viii)  $100^2$

$$100^2 = 100 \times 100$$

$$= 10,000$$

(xii)  $11^2$

$$11^2 = 11 \times 11$$

$$= 121$$

### Exercise: 5.2

1. Find the values of the following:

(i)  $\sqrt{49}$

$$= \sqrt{7 \times 7}$$

$$\sqrt{49} = 7$$

$$\begin{array}{r|l} 7 & 49 \\ \hline 7 & 7 \\ & 1 \end{array}$$

(v)  $\sqrt{225}$

$$= \sqrt{(5 \times 3) \times (5 \times 3)}$$

$$= \sqrt{15 \times 15}$$

$$\sqrt{225} = 15$$

$$\begin{array}{r|l} 3 & 225 \\ \hline 3 & 75 \\ 5 & 25 \\ 5 & 5 \\ & 1 \end{array}$$

(xi)  $\sqrt{576}$

$$= \sqrt{(3 \times 2 \times 2 \times 2) \times (3 \times 2 \times 2 \times 2)}$$

$$= \sqrt{24 \times 24}$$

$$\sqrt{576} = 24$$

$$\begin{array}{r|l} 2 & 576 \\ \hline 2 & 288 \\ 2 & 144 \\ 2 & 72 \\ 2 & 36 \\ 2 & 18 \\ 3 & 9 \\ 3 & 3 \\ \hline & 1 \end{array}$$

### Exercise: 5.3(a)

1. Find the squares of the following:

(i)  $\frac{1}{2}$

$$= \left(\frac{1}{2}\right)^2 \text{ or } \frac{1 \times 1}{2 \times 2}$$

$$= \frac{1}{4}$$

(xii)  $\frac{5}{8}$

$$= \left(\frac{5}{8}\right)^2 \text{ or } \frac{5 \times 5}{8 \times 8}$$

$$= \frac{25}{64}$$

**2. Find the values of the following:**

(i)  $\sqrt{\frac{49}{169}}$

$$= \sqrt{\frac{7 \times 7}{13 \times 13}} = \frac{7}{13}$$

$$\begin{array}{r|l} 7 & 49 \\ \hline 7 & 7 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 13 & 169 \\ \hline 13 & 13 \\ \hline & 1 \end{array}$$

(v)  $\sqrt{\frac{256}{121}}$

$$= \sqrt{\frac{(2 \times 2 \times 2 \times 2) \times (2 \times 2 \times 2 \times 2)}{11 \times 11}}$$

$$= \sqrt{\frac{16 \times 16}{11 \times 11}} = \frac{16}{11}$$

$$\begin{array}{r|l} 2 & 256 \\ \hline 2 & 128 \\ \hline 2 & 64 \\ \hline 2 & 32 \\ \hline 2 & 16 \\ \hline 2 & 8 \\ \hline 2 & 4 \\ \hline 2 & 2 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 11 & 121 \\ \hline 11 & 11 \\ \hline & 1 \end{array}$$

(xii)  $\sqrt{\frac{1}{4}}$

$$= \sqrt{\frac{1 \times 1}{2 \times 2}} = \frac{1}{2}$$

$$\begin{array}{r|l} 1 & 1 \\ \hline 1 & 1 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 2 & 4 \\ \hline 2 & 2 \\ \hline & 1 \end{array}$$

**Note:** Square of 1 = 1  
Root of 1 = 1

**Exercise: 5.3(b)**

**1. Find the squares of**

(i) 0.5

$$= \left(\frac{5}{10}\right)^2 = \frac{25}{100}$$

$$= 0.25$$

(v) 0.09

$$= \left(\frac{9}{100}\right)^2 = \frac{81}{10,000}$$

$$= 0.0081$$

(ix) 1.5

$$= \left(\frac{15}{10}\right)^2 = \frac{225}{100}$$

$$= 2.25$$

**2. Find the square roots of**

(i) 0.64

$$= \sqrt{\frac{64}{100}}$$

$$= \sqrt{\frac{(2 \times 2 \times 2) (2 \times 2 \times 2)}{(5 \times 2) (5 \times 2)}}$$

$$= \sqrt{\frac{8 \times 8}{10 \times 10}}$$

$$= \frac{8}{10} \Rightarrow 0.8$$

$$\begin{array}{r|l} 2 & 64 \\ \hline 2 & 32 \\ \hline 2 & 16 \\ \hline 2 & 8 \\ \hline 2 & 4 \\ \hline 2 & 2 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 2 & 100 \\ \hline 2 & 50 \\ \hline 5 & 25 \\ \hline 5 & 1 \end{array}$$

(ii) 0.09

$$= \sqrt{\frac{9}{100}}$$

$$= \sqrt{\frac{3 \times 3}{10 \times 10}}$$

$$= \frac{3}{10} \Rightarrow 0.3$$

$$\begin{array}{r|l} 3 & 9 \\ \hline 3 & 3 \\ \hline & 1 \end{array}$$

(ix) 6.25

$$= \sqrt{\frac{625}{100}}$$

$$= \sqrt{\frac{(5 \times 5) (5 \times 5)}{10 \times 10}}$$

$$= \sqrt{\frac{25 \times 25}{10 \times 10}}$$

$$= \frac{25}{10} \Rightarrow 2.5$$

$$\begin{array}{r|l} 5 & 625 \\ \hline 5 & 125 \\ \hline 5 & 25 \\ \hline 5 & 5 \\ \hline & 1 \end{array}$$

### Exercise: 5.4

1. A square has an area of 324 sq.cm. What is the length of the side of the square?

**Solution:**

Area of square = side x side

area of square = 324 sq.cm

Hence side =  $\sqrt{324}$

=  $\sqrt{(3 \times 3 \times 2) (3 \times 3 \times 2)}$

=  $\sqrt{18 \times 18}$

Side/length = 18cm

2. A square carpet has a side of 10m. What is the area of carpet?

**Solution:**

Area of square = side<sup>2</sup>

Area of carpet = 10<sup>2</sup>

Area of carpet = 10 x 10

Area of carpet = 100sq.cm

## Average

## Exercise: 6.1

1. Find the arithmetic mean of the following sets of numbers.

(i) 15, 16, 40 and 42

$$\text{Arithmetic mean} = \frac{15 + 16 + 40 + 42}{4}$$

$$\text{A.M} = \frac{113}{4} \Rightarrow \text{A.M} = 28.25$$

(ii) 7.3, 5.9, 5.5 and 4.7

$$\text{Arithmetic mean} = \frac{7.3 + 5.9 + 5.5 + 4.7}{4}$$

$$\text{A.M} = \frac{23.4}{4} \Rightarrow \text{A.M} = 5.85$$

(v) 7334, 7527 and 7495

$$\text{Arithmetic mean} = \frac{7334 + 7527 + 7495}{3}$$

$$\text{A.M} = \frac{22356}{3} \Rightarrow \text{A.M} = 7452$$

2. One week temperature record for Karachi in the morning was as follows: give in the table.

What was the mean temperature in morning for the week?

$$\text{Arithmetic mean} = \frac{20 + 18 + 19 + 20 + 19 + 22}{7}$$

$$\text{A.M} = \frac{136}{7} \Rightarrow \text{A.M} = 19.4$$

3. The weekly salary five labours is 120, 135, 120, 150 and 175 rupees, what is the mean of their salary per week?

$$\text{Arithmetic mean} = \frac{120 + 135 + 120 + 150 + 175}{5}$$

$$\text{A.M} = 700$$

$$\text{A.M} = 140$$

4. In a family of four members, the father weighs 65kg, mother weighs 59kg, son 30kg and daughter 25kg. What is the mean weight of the family?

$$\text{Arithmetic mean} = \frac{65 + 59 + 30 + 25}{4}$$

$$\text{A.M} = \frac{179}{4}$$

$$\text{A.M} = 44.75$$

5. A certain type of colour-box is available in different shops at variable prices of rupees 40, 42, 35, 47, 39 and 41.

What is the mean price of the colour-box?

$$\text{Arithmetic mean} = \frac{40 + 42 + 35 + 47 + 39 + 41}{6}$$

$$\text{A.M} = \frac{244}{6}$$

$$\text{A.M} = 40.66$$

## Exercise: 6.2

1. Find the median of the following sets of numbers

(i) 7, 6, 5, 4, 3, 2 and 1

Hence data is already arranged in descending order.

Median is 4

(v) 100, 150, 132, 110, 167, 144 and 120

First arrange the data

100, 110, 120, 132, 144, 150, 167

Median is 132

2. If number 1 to 15 are arranged in order, what would be the median?

1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15

Median is 8

3. If number 1 to 16 are arranged in order, which two numbers would be used to find the median?

1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16

8 and 9 will be used to find median.

and the median is 8.5

4. In a class of 35 students. Hina received the median score.

a. How many students had scores higher than Hina?

b. How many students had scores higher than Hina?

(a) median of 35 value is 18th value hence 17 student had score lower than Hina.

(b) 17 student score higher marks than Hina.

5. The saving of a family during 6 months are shown in the table. What is the median saving of the family per month?

Arrange saving per month in according order

1500, 1500, 1800, 2000, 2400, 2500

$$\text{Median} = \frac{3^{\text{rd}} + 4^{\text{th}} \text{ value}}{2}$$

$$\text{Median} = \frac{1800 + 2000}{2} \Rightarrow \text{Median} = 1900$$



### Exercise: 6.3

1. Find the modes of the following sets of numbers

(i) 78, 63, 84, 79, 63, 48, 63

Mode = 63 as it is the most repetitive number.

(iii) 10, 12, 14, 16, 18, 12, 20

Mode = 12 as it is the most repetitive number.

2. In a class, students of different age groups have the frequencies as shown in the table. Which age is the mode in the set of ages?

Mode = 13 as its frequency is higher.

3. Find the mode of the following numbers (there might be more than one mode)

57, 76, 64, 85, 92, 76, 93, 85 and 100

Mode = 76 and 85

4. A survey carried out in a class suggested that the favorite eatables were chosen with following frequencies.

Mode = Ice cream as its frequency is higher.

5. Ali counted the number of vowels used on a certain page of a book and recovered the following data.

Mode = a as its frequency is higher.

6. Find the mode of the following numbers:

27, 18, 32, 45, 78, 54 and 45

Mode = 45 as it is the most repetitive value.

### Exercise: 6.4

1. Number of cars passed from the road side in the last 15 days of December are as follows:

Marks	Tally	Frequency
70	11	2
71	1	1
72	1	1
73	1	1
74		
75	1111	5
76	111	3
77		
78		
79	1	1
80	1	1

2. Attendance of 25 students in the month of Feb are as follows:

Student Present	Tally	Frequency
16	111	3
17	11	2
18		0
19	111	3
20		0
21	1	1
22	1	1
23	111	3
24	11	2
25	1111	5

## Introduction to Algebra

### Exercise: 7.1

1. Write whether the following are arithmetic expressions, algebraic expressions or both.

Check the answers from answer script given in text book.

3 - statement

4 - statement

Check the answers from answer script given in text book.

### Exercise: 7.2

1. Evaluate  $\frac{8a}{b}$  When  $a$  and  $b = 4$

$$= \frac{8(4)}{(4)} \Rightarrow \frac{32}{4}$$

= 8 answer

5. Evaluate  $3x - y + z$  when  $x = 4$ ,  $y = 1$  and  $z = 2$

$$= 3(4) - (1) + (2)$$

$$= 12 - 1 + 2$$

$$= 11 + 2$$

$$= 13 \text{ answer}$$

7. Write an algebraic expressions

(ii) 3 times  $x$  added to 2 times  $y$

$$\Rightarrow 3x + 2y$$

(ii) 4 times of  $b$  is subtracted from 5 times of  $a$

$$\Rightarrow 5a - 4b$$

(ix) The product  $m$  and 10, added to 10.

$$\Rightarrow m10 + 10$$

8. Complete the tables by filling the missing numbers.

(i)	If $a =$	0	1	2	3	4
	Then $5a =$	0	5	10	15	20

(iv)	If $z =$	0	2	3	5	6	
	The $5a =$	$\frac{1+z}{3}$	$\frac{1+0}{3} = \frac{1}{3}$	$\frac{1+2}{3} = 1$	$\frac{1+3}{3} = 1.33$	$\frac{1+5}{3} = 2$	$\frac{1+6}{3} = 2.33$

### Exercise: 7.3

1. Find the algebraic sum of

(i)  $3h + 4h + h$

$$= 8h$$

(v)  $5s + 3t - 2s - t$

$$= 5s - 2s + 3t - t$$

$$= 3s + 2t$$

$$\begin{aligned} \text{(x)} \quad & 8x + 5x - 2x + 3x - x \\ & = 16x - 3x \\ & = 13x \end{aligned}$$

$$\begin{aligned} \text{(xx)} \quad & 14c + 7d - 2c - 4d \\ & = 14c - 2c + 7d - 4d \\ & = 12c + 3d \end{aligned}$$

$$\begin{aligned} \text{(xxx)} \quad & 2ab + 10cd - 3cd + 8ab \\ & = 2ab + 8ab + 10cd - 3cd \\ & = 10ab + 7cd \end{aligned}$$

### 1. Simplify

$$\begin{aligned} \text{(i)} \quad & 2 \times 4a \\ & \quad \quad 4a \\ & = \frac{x \ 2}{8a} \end{aligned}$$

$$\begin{aligned} \text{(v)} \quad & 4 \times 4n \\ & \quad \quad 4 \\ & = \frac{x \ 4n}{16n} \end{aligned}$$

$$\begin{aligned} \text{(xvii)} \quad & 3 \times 5x \\ & \quad \quad 3 \\ & = \frac{x \ 5x}{15x} \end{aligned}$$

$$\begin{aligned} \text{(xxix)} \quad & 4 \times 2r \times 4t \\ \text{First} \quad & \quad \quad 4 \\ & = \frac{x \ 2r}{8r} \\ \text{Then} \quad & \quad \quad 8r \\ & = \frac{x \ 4t}{32rt} \end{aligned}$$

### 3. Simplify

$$\begin{aligned} \text{(i)} \quad & 5a \div 5 \\ & \text{Simply divide number} \\ & \text{with number.} \\ & = \frac{5a}{5} \quad \text{or} \quad \begin{array}{r} 1 \\ \overline{)5a} \\ \underline{5} \phantom{a} \\ 1 \phantom{a} \end{array} \\ & = a \text{ Answer} \end{aligned}$$

$$\begin{aligned} \text{(xv)} \quad & 2ab + 3xy - ab + 4xy \\ & = 2ab - ab + 3xy + 4xy \\ & = ab + 7xy \end{aligned}$$

$$\begin{aligned} \text{(xxv)} \quad & 7u + 3t - 2t + 3u \\ & = 7u + 3u + 3t - 2t \\ & = 10u + t \end{aligned}$$

$$\begin{aligned} \text{(iii)} \quad & 3 \times s \\ & \quad \quad 3 \\ & = \frac{x \ s}{3s} \end{aligned}$$

$$\begin{aligned} \text{(xi)} \quad & 3a \times b \\ & \quad \quad 3a \\ & = \frac{x \ b}{3ab} \end{aligned}$$

$$\begin{aligned} \text{(xx)} \quad & 2p \times 3q \times 4r \\ \text{First} \quad & \quad \quad 2p \\ & = \frac{x \ 3q}{6pq} \\ \text{Then} \quad & \quad \quad 6pq \\ & = \frac{x \ 4r}{24pqr} \end{aligned}$$

$$\begin{aligned} \text{(ii)} \quad & 21x \div 3x \\ & = \frac{21x}{3x} \quad \text{or} \quad \begin{array}{r} 7 \\ \overline{)21} \\ \underline{3} \phantom{x} \\ 1 \phantom{x} \end{array} \quad \begin{array}{r} 1 \\ \overline{)x} \\ \underline{x} \\ 1 \end{array} \\ & = 7 \text{ Answer} \end{aligned}$$

$$(vii) 54cd \div 9c$$

$$= \frac{54 \cancel{cd}}{9\cancel{c}} \text{ or } \frac{\overset{6}{\cancel{54}} \overset{1}{\cancel{c}}}{\underset{1}{\cancel{9}} \underset{1}{\cancel{c}}}$$

$$= 6 \times 1 \times d$$

$$= 6d \text{ Answer}$$

$$(xx) 15pqr \div 15pr$$

$$= \frac{15 \cancel{pqr}}{15 \cancel{pr}} \text{ or } \frac{\overset{1}{\cancel{15}} \overset{1}{\cancel{p}} \overset{1}{\cancel{q}} \overset{1}{\cancel{r}}}{\overset{1}{\cancel{15}} \overset{1}{\cancel{p}} \overset{1}{\cancel{r}}}$$

$$= 1 \times 1 \times q \times 1$$

$$= q \text{ Answer}$$

#### 4. Simplify

$$(i) 18st \div 3s$$

$$= \frac{18 \cancel{st}}{3\cancel{s}} \text{ or } \frac{\overset{6}{\cancel{18}} \overset{1}{\cancel{s}} \overset{1}{\cancel{t}}}{\overset{1}{\cancel{3}} \overset{1}{\cancel{s}}}$$

$$= 6 \times 1 \times t$$

$$= 6t \text{ Answer}$$

$$(ix) \frac{9x}{10y} \times 5by$$

Multiply the numerator first

$$= \frac{18 \cancel{st}}{3\cancel{s}} \text{ or } \frac{\overset{6}{\cancel{18}} \overset{1}{\cancel{s}} \overset{1}{\cancel{t}}}{\overset{1}{\cancel{3}} \overset{1}{\cancel{s}}}$$

$$= 9x \times 5by$$

$$= \frac{9x \times 5by}{45bxy}$$

Then, divide the multiplicand by denominator i.e;

$$= \frac{45 \cancel{bxy}}{10y}$$

$$= \frac{\overset{9}{\cancel{45}} \overset{1}{\cancel{b}} \overset{1}{\cancel{x}} \overset{1}{\cancel{y}}}{\overset{1}{\cancel{10}} \overset{1}{\cancel{y}}}$$

$$= \frac{9}{2} bx \text{ Answer}$$

$$(xiv) 12xy \div 2x$$

$$= \frac{12 \cancel{xy}}{2\cancel{x}} \text{ or } \frac{\overset{6}{\cancel{12}} \overset{1}{\cancel{x}} \overset{1}{\cancel{y}}}{\overset{1}{\cancel{2}} \overset{1}{\cancel{x}}}$$

$$= 6 \times 1 \times y$$

$$= 6y \text{ Answer}$$

$$(xxiv) xyz \div 2z$$

$$= \frac{xyz}{2z} \text{ or } \frac{1}{2} xy \frac{\overset{1}{\cancel{z}}}{\overset{1}{\cancel{z}}}$$

$$= \frac{xy}{2} \text{ Answer}$$

$$(iii) 21xy \div 3y$$

$$= \frac{21 \cancel{xy}}{3\cancel{y}} \text{ or } \frac{\overset{7}{\cancel{21}} \overset{1}{\cancel{y}} \overset{1}{\cancel{x}} \overset{1}{\cancel{t}}}{\overset{1}{\cancel{3}} \overset{1}{\cancel{y}}}$$

$$= 7x \text{ Answer}$$

$$(xiv) 15abc \times \frac{2d}{5ab}$$

First,

$$15abc \times 2d$$

$$= \frac{15abc \times 2d}{30abcd}$$

Then,

$$= \frac{30abcd}{5ab}$$

$$= \frac{\overset{6}{\cancel{30}} \overset{1}{\cancel{a}} \overset{1}{\cancel{b}} \overset{1}{\cancel{c}} \overset{1}{\cancel{d}}}{\overset{1}{\cancel{5}} \overset{1}{\cancel{a}} \overset{1}{\cancel{b}} \overset{1}{\cancel{c}} \overset{1}{\cancel{d}}}$$

$$= 6 \times 1 \times 1 \times c \times d$$

$$= 6cd \text{ Answer}$$

$$(xvii) \frac{ab}{c} \div \frac{1}{bd}$$

$$\frac{ab}{c} \div \frac{bd}{1}$$

First

$$= \frac{ab}{c} \times \frac{bd}{1} \quad \text{or} \quad ab^2d$$

Then

$$= \frac{ab^2d}{c} \quad \text{Answer}$$

$$(xviii) \frac{2xy}{3ac} \div \frac{2y}{3a}$$

$$\frac{2xy}{3ac} \times \frac{3a}{2y}$$

First,

$$= \frac{2xy}{3ac} \times \frac{3a}{2y} \quad \text{and} \quad \frac{3a}{6ay}$$

Then

$$= \frac{6axy}{6acy} \quad \text{or} \quad \frac{6}{3} \times \frac{a}{a} \times \frac{1}{c} \times \frac{x}{1} \times \frac{y}{y}$$

$$= \frac{x}{c} \quad \text{Answer}$$

## Exercise: 7.4

Check the answer script given in the book.

## Exercise: 7.5

### 1. Solve to following equations

$$(i) t - 2 = 7$$

Add 2 to both sides

$$t - 2 + 2 = 7 + 2$$

$$t = 9 \quad \text{Answer}$$

$$(ix) c - 12 = 24$$

Add 12 to both sides

$$c - 12 + 12 = 24 + 12$$

$$c = 36 \quad \text{Answer}$$

$$(xiii) z - 12 = 19$$

Add 12 to both sides

$$z - 12 + 12 = 19 + 12$$

$$z = 30 \quad \text{Answer}$$

$$(v) a - 10 = 15$$

Add 10 to both sides

$$a - 10 + 10 = 15 + 10$$

$$a = 25 \quad \text{Answer}$$

$$(xi) s - 3 = 11$$

Add 3 to both sides

$$s - 3 + 3 = 11 + 3$$

$$s = 14 \quad \text{Answer}$$

$$(xvii) x - 12 = 15$$

Add 12 to both sides

$$x - 12 + 12 = 15 + 12$$

$$x = 27 \quad \text{Answer}$$

### 2. Find the value of n in the following questions.

$$(i) n + 5 = 23$$

Subtract 5 from both sides

$$n + 5 - 5 = 23 - 5$$

$$n = 18 \quad \text{Answer}$$

$$(v) n + 7 = 12$$

Add 7 from both sides

$$n + 7 - 7 = 12 - 7$$

$$n = 5 \quad \text{Answer}$$

(ix)  $n + 5 = 9$

Subtract 5 from both sides

$$n + 5 - 5 = 9 - 5$$

$$n = 4 \text{ Answer}$$

(xviii)  $7 + n = 21$

can be written as  $n + 7 = 21$

Subtract 7 from both sides

$$= 7 - 7 + n = 21 - 7$$

$$n = 14 \text{ Answer}$$

(xi)  $n + 3 = 11$

Subtract 3 from both sides

$$n + 3 - 3 = 11 - 3$$

$$n = 8 \text{ Answer}$$

**3. Solve the following equations.**

(i)  $3x = 21$

Divide both sides by 3

$$\frac{2x}{3} = \frac{21}{3}$$

$$x = 7 \text{ Answer}$$

(xi)  $5y = 40$

divide both sides by 5

$$\frac{5x}{5} = \frac{40}{5}$$

$$y = 8 \text{ Answer}$$

(xxiii)  $\frac{c}{4} = 12$

Multiply both sides by 4

$$\frac{4c}{4} = 12 \times 4$$

$$c = 48 \text{ Answer}$$

(v)  $9x = 12$

Divide both sides by 9

$$\frac{9x}{9} = \frac{12}{9}$$

$$x = \frac{3}{9}$$

(xvii)  $\frac{t}{9} = 5$

Multiply both side with 9

$$\frac{9t}{9} = 5 \times 9$$

$$t = 45 \text{ Answer}$$

(xxx)  $\frac{r}{7} = 9$

Multiply both sides with 7

$$\frac{7r}{7} = 9 \times 7$$

$$x = 63 \text{ Answer}$$

#### 4. Solve the following equations.

$$(i) \frac{4z}{2} = 24$$

$$\frac{4z}{2} = 24$$

$$2z = 24$$

Now divide both sides by 2

$$\frac{2z}{2} = \frac{24}{2}$$

$$z = 12 \text{ Answer}$$

$$(xiv) \frac{p}{10} - \frac{16}{10} = 0$$

$$\frac{p-16}{10} = 0$$

Multiply both sides with 10

$$\frac{p-16}{10} \times 10 = 0 \times 10$$

$$p - 16 = 0$$

Add 16 to both sides

$$p - 16 + 16 = 0 + 16$$

$$x = 16 \text{ Answer}$$

$$(xviii) 2x - 18 = 0$$

Add 18 to both sides

$$2x - 18 + 18 = 0 + 18$$

$$2x = 18$$

Divide both sides by 2

$$\frac{2x}{2} = \frac{18}{2}$$

$$x = 9 \text{ Answer}$$

$$(v) \frac{4x}{3} + 2 = 10$$

Step # 1

Subtract 2 from both sides

$$\frac{4x}{3} + 2 - 2 = 10 - 2$$

$$\frac{4x}{3} = 8$$

Step # 2

Multiply both sides by 3

$$\frac{4x}{3} \times 3 = 8 \times 3$$

$$4x = 24$$

Step # 3

Now divide both sides by 4

$$\frac{4x}{4} = \frac{24}{4}$$

$$x = 6 \text{ Answer}$$

### Exercise: 7.6

#### Solve to following

(i) A man earns 3 times as much as his wife does. If his wife earns 900 rupees, how much does the man earn?

**Solution:**

$$3 \text{ times } x = y$$

$$x = \text{salary of wife which is Rs. 900}$$

$$y = \text{salary of man/husband} = ?$$

Now,

$$3(900) = y$$

$$y = \text{Rs. 2700} \text{ Answer}$$

(ii) The sum of a number and  $\frac{1}{4}$  of that number is 15. What is the number?

**Solution:**

$$x + \frac{x}{4} = 15$$

First find the sum of left hand side.

$$\frac{x}{1} + \frac{x}{4} = 15$$

$$\frac{4x+x}{4} = 15$$

Multiply both sides with 4

$$4 \times \frac{4x+x}{4} = 15 \times 4$$

$$5x = 60$$

Divide both side by 5

$$\frac{5x}{5} = \frac{60}{5} \Rightarrow x = 12 \text{ Answer}$$

(iii) At a party there were 8 more women than men. If the number of women was 10, how many men were at the party?

**Solution:**

$$w - 8 = m \Rightarrow 2 = m$$

$$\text{or } m = 2 \text{ Answer}$$

(iv) Hina solved 12 problems. This was 4 less than Kiran did. How many problems did Kiran solve?

**Solution:**

$$K = H + 4$$

K = number of questions Kiran solved

H = number of question Hina solved

$$K = 12 + 4$$

$$K = 16 \text{ Answer}$$

(v) A straw  $x$  feet long was divided into three equal parts. How long was each part?

**Solution:**

Length of straw =  $x$  feet

Divided into three equal parts

$$\frac{x}{3} \text{ Answer}$$

(vi) The product of two numbers is 10. If one of the numbers is 5, what is the other number?

**Solution:**

$$x \times 5 = 10$$

Divide both sides by 5

$$\frac{x + 5}{5} = \frac{10}{5} \text{ Answer}$$

$$x = 2 \text{ Answer}$$



(vii) Salma weighs 15 pounds more than Kiran. If Kiran weighs 30 pounds, what is Salma's weight?

**Solution:**

$$S + 15 = K \quad \Rightarrow \quad 2 = m$$

K = Kiran's weight which is 30 pound.

$$S + 15 = 30$$

Subtract 15 from both sides

$$S + 15 - 15 = 30 - 15$$

$$S = 15$$

Salma's weight is 15 pound.

(viii) Mother bought  $x$  kg of meat and 2 kg of flour. What is the total weight of her shopping?

**Solution:**

$$x \text{ Kg} + 2 \text{ Kg} = \text{mother's total shopping}$$

$$x + 2\text{Kg} \text{ Answer}$$

(ix) Bananas cost  $x$  rupees per dozen. What is the cost of 4 dozen bananas?

**Solution:**

$$x \times 4 \text{ is the total cost of bananas}$$

$$4x \text{ Answer}$$

(x) Kiran is  $y$  years old. How old was she 10 years ago? How old will she be after 5 years?

**Solution:**

10 years ago Kiran was

$$y - 10 \text{ years old}$$

5 years after Kiran will be  $y + 5$  year old.

(xi) In a class there are twice as many boys as girls. If there are a total of 42 students in the class, find how many boys and girls are in the class?

**Solution:**

$$\text{boys} + \text{girls} = 42 \longrightarrow \text{equation 1}$$

and there are 2 times as many boys as girls

$$\text{So } 2 \times g = b \longrightarrow \text{equation 2}$$

Consider equation 1

$$b + g = 42$$

from equation 2 we know

$$b = 2g$$

now put the value of  $b$  in equation 1

$$\text{i.e; } 2g + g = 42$$

$$3g = 42$$

divide both side by 3

$$\frac{3g}{3} = \frac{42}{3}$$

$$g = 14$$

these are 14 girls in the class

to find the number of boys; put the value of  $g$  in equation 2

$$2g = b$$

$$2(14) = b$$

$$b = 28$$

(xii) The difference between two numbers is 14. If one of the numbers is 36, what is the other number?

**Solution:**

$$a - x = 14$$

$$\text{if } a = 36$$

then

$$36 - x = 14$$

subtract 36 from both sides

$$36 - 36 - x = 14 - 36$$

$$-x = -22$$

or

$$x = 22 \text{ Answer}$$

(xiii) Ali bought 9 oranges. If his sister ate  $x$  oranges, how many oranges did Ali eat?

**Solution:**

Ali ate  $9 - x$  oranges

$$9 - x \text{ Answer}$$

(xiv) The cost of 1 pen and 10 pencils is Rs. 60. If the cost of the pen is Rs. 45, find the cost of each pencil.

**Solution:**

Let the price of pen =  $x$

Pencil =  $y$

$$x + 10y = 60$$

Subtract 45 from both side

$$45 - 45 + 10y = 60 - 45$$

$$10y = 15$$

divide both sides by 10

$$\frac{10y}{10} = \frac{15}{10}$$

$$y = 1.5 \text{ Answer}$$

each pencil cost Rs. 1.5

(xv) The sum of two consecutive even number is 38. Find the numbers.

**Solution:**

Let " $x$ " is an even number the next even number

after " $x$ " will be " $x + 2$ ".

$$x + (x + 2) = 38$$

or

$$x + x + 2 = 38$$

subtract 2 from both sides

$$x + x + 2 - 2 = 38 - 2$$

$$x + x = 36 \text{ or } 2x + 36$$

Now, divide both side by 2

$$\frac{2x}{2} = \frac{36}{2}$$

$x = 18$  and  $x + 2 = 20$  Answer

(xvi) The sum of two consecutive odd numbers is 44. Find the numbers.

**Solution:**

Let "x" is an odd number the next odd number after "x" will be " $x + 2$ ".

Now  $x + x + 2 = 44$

$$2x + 2 = 44$$

subtract 2 from both sides

$$2x + 2 - 2 = 44 - 2$$

$$2x = 42$$

Divide both sides by "2"

$$\frac{2x}{2} = \frac{42}{2}$$

$x = 21$  and  $x + 2 = 23$  Answer

(xvii) A father is 25 years older than his son. After 10 years the sum of their ages will be 65. What will be their respective ages?

**Solution:**

Let the father age is  $x$  and son age is  $y$   
according to the question we know

$$x = y + 25 \longrightarrow \text{equation 1}$$

after 10 years  $x + y = 65$

put the value of  $x$  from equation 1

$$(y + 25) + y = 65$$

or

$$y + y + 25 = 65$$

subtracft 25 from both sides

$$2y + 25 - 25 = 65 - 25$$

$$2y = 40$$

Now divide both sides by 2

$$\frac{2y}{2} = \frac{40}{2}$$

$$y = 20$$

after 10 year son's age will be 20 years

to final the father's age

put the value of "y" in equation 1

$$x = y + 25$$

$$x = 20 + 25$$

$$x = 45$$

Father's age will be 45 years

(xviii) The price of a bus ticket is Rs. 2.5. If a sum of Rs. 20 is paid for the tickets, find the number of tickets bought.

**Solution:**

Let "x" is the number of ticket bought

$$x \times 2.5 = 20$$

divide both side by 2.5 we get,

$$\frac{2.5x}{2.5} = \frac{20}{2.5}$$

$$x = 8$$

(xix) Divide Rs. 156 among two boys, such that one boy gets twice as much as the other.

**Solution:**

Let the first boy get = x

and the second boy get = y

we know first boy get twice as much as second

$$x = 2y \longrightarrow \text{equation 1}$$

and the sum of x and y is Rs. 156

$$x + y = 156$$

put the value of x from equation 1

$$2y + y = 156$$

$$3y = 156$$

divide both side by 3

$$\frac{3y}{3} = \frac{156}{3}$$

$$y = 52$$

Now put the value of "y" in equation 1 we get

$$x = 2y$$

$$x = 2(52)$$

$$x = 104 \text{ Answer}$$

(xx) Kiran and Hina share 108 marbles, such that Kiran has 5 times as many as Hina. How many does each have?

**Solution:**

Let the number of marbles Kiran get is "x" the number of marbles

Hine get is "y"

We know

$$x = 5y \longrightarrow \text{equation 1}$$

and

$$x + y = 108$$

Put the value of "x" from equation 1

$$5y + y = 108$$

$$6y = 108$$

divide both sides by 6

$$\frac{6y}{6} = \frac{108}{6}$$

$$y = 18$$

Now, put the value of "y" in equation 1

$$x = 5y$$

$$x = 5(18)$$

$$x = 90 \text{ Answer}$$

(xxi) Share Rs. 90 among Fazal and Akhtar, such that Fazal gets twice what Akhtar gets.

**Solution:**

Let Fazal's share =  $a$

Akhtar's share =  $b$

We Know

$$a = 2b \quad \text{equation 1}$$

$$\text{and } a + b = 90$$

put the value of "a" from equation 1

$$a + b = 90$$

$$2b + b = 90$$

$$3b = 90$$

divide both side by "3"

$$\frac{3b}{3} = \frac{90}{3}$$

$$b = 30$$

Now, put the value of "b" in equation 1

$$a = 2b$$

$$a = 2(30)$$

$$a = 60 \text{ Answer}$$

## Chapter 8

### Ratio and Proportion

#### Exercise: 8.1

1. Find the ratio of

Check the answer script given in the text book.

2. The result of a maths test were as follows:

Check the answer script given in the text book.

#### Exercise: 8.2

1. Give equivalent ratio for each which has lowest terms.

(i) 6 : 12

First, write the ratio as fraction

$$\frac{6}{12}$$

Lowest term of 6:12 is 1:2

(vi) 24 : 27

First, write the ratio as fraction

$$\frac{24}{27}$$

Lowest term of 24:27 is 6:7

## 2. Complete

Check the answers from answers given in the text book.

## 3. Complete each ratio such that the equivalent ratio is 3:4

Check the answers from answers given in the text book.

### Exercise: 8.3

#### 1. Which ratio is greater?

(i) 2:5 or 3:4

Lets convert 2.5 to equivalent ratio with denominator 20.

$$2:5 = 8:20$$

Now convert 3:4 to equivalent ratio with denominator 20

$$3:4 = 15:20$$

Now, compare

$$8:20 \text{ with } 15:20$$

15:20 is greater which means

$$2:5 < 3:4$$

(vi) 3:7 or 1:2

first convert 3:7 to equivalent ratio with denominator 14

$$3:7 = 6:14$$

Now convert 1:2 to equivalent ratio with denominator 14

$$1:2 = 7:14$$

Lets compare

$$6:14 \text{ with } 7:14$$

7:14 is greater which means

$$3:7 < 1:2$$

#### 2. Solve the following:

(i) Write the ratio between 10cm and 1m

##### Solution:

first convert the m into cm

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

$$10 : 100$$

or

$$1 : 10$$

(ii) The measurements of a carpet are 10' x 15'. What is the ratio of the width to the length and ratio of the length to the width?

**Solution:**

$$L \times w = 10' \times 15'$$

the ratio of L : w is 10 : 15

or 2 : 3

and the ratio of w : L is 15 : 10 or 3 : 2 Answer

(iii) The numbers are in the ratio of 4 : 3. If first number is 12, what is the other number?

**Solution:**

4 : 3 if first number is 12

$$\frac{4}{3} = \frac{12}{?}$$

$$\frac{4 \text{ (x 3)}}{3 \text{ (x 3)}} = \frac{12}{9}$$

the second number will be 9

(iv) The ratio of the length to the width of a figure is 1 : 1. What is this type of figure called?

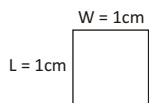
**Solution:**

if length to width ratio is equivalent ratios are called square ratios.

**Explanation**

Observe the figure

the figure is a complete square



(v) A T-shirt which originally cost 100 rupees was sold for 75 rupees in sale. What is the ratio between the original price of T-shirt and the new price?

**Solution:**

Ratio of original price and discounted price is 100 : 75

$$\text{Lowest term} = \frac{100}{75} = \frac{4}{3}$$

4 : 3 Answer

(vi) The ratio of girls to boys in a class is 5 : 6. Are there more girls or boys in the class?

**Solution:**

Ratio of Girls : boys

5 : 6

it means there are more boys in the class.

(vii) The ratio of number of women to the number of men working in a factory is 2 : 5. If there are 600 workers in the factory, how many are women and how many are men? (round of your answer to nearest whole number)

**Solution:**

Date:

Ratio of women 2

Ratio of men  $\frac{5}{7}$

Total worker = 600

Now,

To find the number of women workers =  $\frac{\text{Total worker}}{\text{sum of ratio}} \times \text{women Ratio}$

$$= \frac{600}{7} \times 2$$

Women workers = 171.4  $\cong$  171

Men workers =  $\frac{\text{Total worker}}{\text{sum of ratio}} \times \text{men ratio}$

$$= \frac{600}{7} \times 5 \Rightarrow \text{Men workers} = 428.57 \cong 429$$

(viii) The ratio of red balls to blue balls is 1 : 5. If there are 4 red balls, how many blue balls are there?

**Solution:**

Ratio of red ball : blue balls

1 : 5

if there are 4 red balls

$$\frac{1}{5} = \frac{4}{?}$$

$$\frac{1}{5} \begin{matrix} \textcircled{\times 4} \\ \textcircled{\times 4} \end{matrix} = \frac{4}{20}$$

Blue balls are 20

(ix) A concentrated juice is to be mixed with water in the ratio of 1 : 3.

- How much water should be added to 3 spoons of juice?
- How much water should be added to 6 spoons of juice?

**Solution:**

Ratio of juice to water is

1 : 3

a. if juice is 3 spoons

$$1 : 3 \Rightarrow (1 \times 3) : (3 \times 3)$$

$$\frac{1}{5} = \frac{4}{?}$$



$$\frac{\overset{\textcircled{\times 4}}{1}}{\underset{\textcircled{\times 4}}{5}} = \frac{4}{20}$$

Blue balls are 20

- (x) A man earns 4,000 rupees a month and saves 800 rupees every month. Express his income as a ratio of his saving.

**Solution:**

To find the ratio of income to saving = 4000 : 800

or

$$\frac{\overset{5}{4000}}{\underset{1}{800}}$$

=> 5 : 1

- (xi) There are twice as many boys in a school as there are girls. If there are 175 girls.
- How many boys are there?
  - Find the total number of students in the school.
  - Express the numbers of girls as a fraction of total number of students.
  - Express the numbers of boys as a fraction of total number of students.

**Solution:**

Ratio of boy to girl is 2 : 1

- (a) If there are 175 girls,  
 $(2 \times 175) : (1 \times 175)$   
 $350 : 175$   
 there are 350 boys

- (b) Number of boys + number of girls  
 $350 + 175$   
 Total : 525

- (c) Number of girls as a fraction of total students.

$$\frac{\text{Total students}}{\text{Number of girls}} = \frac{\overset{3}{525}}{\underset{1}{175}}$$

$$= \frac{3}{1} \text{ Answer}$$

- (d) Number of boys as a fraction of total student.

$$\frac{\text{Total students}}{\text{Number of boys}} = \frac{\overset{3}{525}}{\underset{2}{350}}$$

$$= \frac{3}{2} \text{ Answer}$$

## Exercise: 8.4

1. In each proportion, show that the product of extremes is equal to the product of means.

$$(i) \quad 1 : 5 = 12 : 60$$

$$1 \times 60 = 60$$

$$5 \times 12 = 60$$

or

$$1 \times 60 = 5 \times 12$$

$$(iii) \quad 6 : 54 = 1 : 9$$

$$6 \times 9 = 54$$

$$54 \times 1 = 54$$

or

$$6 \times 9 = 54 \times 1$$

$$(v) \quad 6 : 8 = 9 : 12$$

$$6 \times 12 = 72$$

$$8 \times 9 = 72$$

or

$$6 \times 12 = 8 \times 9$$

2. Solve these proportions:

$$(i) \quad \frac{2}{3} = \frac{x}{12}$$

Cross multiply

$$2(12) = x(3)$$

$$24 = 3x$$

divide both sides by 3

$$\overset{8}{\cancel{24}^1} = \overset{1}{\cancel{3x}^1}$$

$$x = 8 \text{ Answer}$$

$$(iii) \quad \frac{5}{x} = \frac{15}{21}$$

Cross multiply

$$5(21) = 15(x)$$

$$105 = 15x$$

divide both sides by 15

$$\overset{7}{\cancel{105}^1} = \overset{1}{\cancel{15x}^1}$$

$$x = 7 \text{ Answer}$$

$$(v) \quad \frac{5}{8} = \frac{x}{40}$$

Cross multiply

$$5 \times 40 = 8 \times x$$

$$200 = 8x$$

divide both sides by 8

$$\overset{25}{\cancel{200}^1} = \overset{1}{\cancel{8x}^1}$$

$$x = 25 \text{ Answer}$$

3. Solve the following:

(i) A car travels 10 miles in 12 minutes. At the same rate, How far will the car travel in an hour?

**Solution:**

$$10 : 12 = x : 60$$

$$600 = 12x$$

divide both side by "12"

$$\overset{50}{\cancel{600}^1} = \overset{1}{\cancel{12x}^1} \Rightarrow x = 50 \text{ miles}$$

(ii) On a certain map, 4 feet are represented by 1 inch. How much distance do 8 inches represent?

**Solution:**

$$4 : 1 = x : 8$$

$$4 \times 8 = 1 \times x$$

$$32 = x \quad \text{or} \quad x = 32 \text{ feet}$$

(iii) A man earned a commission of 100 rupees on sales of 3000 rupees. At this rate, how much commission will he earn on sales of 7500 rupees?

**Solution:**

$$3000 : 100 = 7500 : x$$

$$3000x = 750000$$

divide both side by 3000

$$\frac{3000x}{3000} = \frac{750000}{3000}$$

$$x = 250 \text{ Rupees}$$

(iv) A factory produces 2000 cans of tinned fruit every month. How many cans does it produce in a year?

**Solution:**

$$1 : 200 = 12 : x$$

$$x = 200 \times 12$$

$$x = 2400 \text{ cans}$$

(v) The dimensions of width and length of a rectangle are in the ratio of 7 : 8. What is the width of the rectangle if it is 40 inches long?

**Solution:**

$$7 : 8 = x : 40$$

$$280 = 8x$$

divide both side by 8

$$\frac{280}{8} = \frac{8x}{8}$$

$$x = 35 \text{ inch}$$

(vi) Two numbers are in the ratio 5 : 8. If one of the numbers is 80, what is the other number?

**Solution:**

$$5 : 8 = 80 : x$$

$$5x = 8 \times 80$$

$$5x = 640$$

divide both side by 5

$$\frac{5x}{5} = \frac{640}{5}$$

$$x = 128$$

(vii) The ratio of Kamal's salary to Akhtar's salary is 2 : 3. If Kamal's salary is 1800 rupees, what is Akhtar's salary?

**Solution:**

$$2 : 3 = 1800 : x$$

$$2x = 3 \times 1800$$

$$2x = 5400$$

divide both sides by 2

$$\frac{2x}{2} = \frac{5400}{2}$$

$$x = 2700$$

(viii) The interest on a loan of 1200 rupees was 100 rupees. What would be the interest on a loan of 6000 rupees?

**Solution:**

$$1200 : 100 = 6000 : x$$

$$1200x = 600000$$

divide both side by 1200

$$\frac{1200x}{1200} = \frac{600000}{1200}$$

$$x = 500 \text{ Rupees}$$

(ix) The ratio between the measure of two angles is 4 : 5. If one angle is 20°, what is the other angle?

**Solution:**

$$4 : 5 = 20 : x$$

$$4x = 20 \times 5$$

$$4x = 100$$

divide both side by 4

$$\frac{4x}{4} = \frac{100}{4}$$

$$x = 25$$

(x) Eggs are being sold at 24 rupees per dozen. How much would 6 dozens cost?

**Solution:**

$$24 : 1 = x : 6$$

$$24 \times 6 = x$$

$$144 = x \quad \text{or} \quad x = 144 \text{ Rupees}$$

(xi) A car travels 340 km on 40 litres of petrol. What is its petrol consumption if it travels 100 km?

**Solution:**

$$340 : 40 = 100 : x$$

$$340x = 40 \times 100$$

$$340x = 4000$$

divide both side by 340

$$\frac{340x}{340} = \frac{4000}{340}$$

$$x = 11.76 \text{ liter}$$

$$\begin{array}{r} 17 \overline{) 200} \quad 11.76 \\ - 174 \\ \hline 30 \\ - 17 \\ \hline 130 \\ - 119 \\ \hline 110 \\ \underline{102} \\ 8 \end{array}$$

(xii) Two numbers are in the ratio 3:4. If one of the numbers is 48, find the other number?

**Solution:**

$$3 : 4 = 48 : x$$

$$3x = 4 \times 48$$

$$3x = 192$$

divide both side by 3

$$\frac{3x}{3} = \frac{192}{3}$$

$$x = 64$$

(xiii) A clock gets behind the time by 200 seconds in 1 week. How many seconds will it lose in 14 days?

**Solution:**

**Note:** 1 week has 7 days so 14 day makes 2 weeks

$$1 : 200 = 2 : x$$

$$x = 200 \times 2$$

$$x = 400 \text{ seconds}$$

### FUN TIME

Complete these proportion diagrams working out the missing term.

(i)

2	12
3	x

$$\frac{2}{3} = \frac{12}{x}$$

Cross multiply

$$2 : x = 3 : 12$$

$$2 \times 12 = 3x$$

$$3x = 24$$

$$\frac{3x}{3} = \frac{24}{3}$$

$$x = 8$$

(vii)

7	x
24	72

$$\frac{9}{24} = \frac{x}{72}$$

$$9 : 72 = x : 24$$

$$9 \times 24 = 72x$$

$$216 = 72x$$

divide both side by 72

$$\frac{216}{72} = \frac{72x}{72}$$

$$x = 3$$

(xii)

11	33
x	21

$$\frac{11}{x} = \frac{33}{21}$$

$$11 : 21 = 33 : x$$

$$11x = 21 \times 33$$

$$11x = 693$$

divide both sides by 11

$$\frac{11x}{11} = \frac{693}{11}$$

$$x = 63$$

## Percentage

## Exercise: 9.1

1. Look at the following and write what percent of the square is coloured.

Check answer from answer script given in the text book.

2. Write the following percent as hundredths:

(i) 27%

$$\Rightarrow \frac{27}{100}$$

(ii) 9%

$$\Rightarrow \frac{9}{100}$$

(vii) 2%

$$\Rightarrow \frac{2}{100}$$

(viii) 48%

$$\Rightarrow \frac{48}{100}$$

## Exercise: 9.2

1. Write each decimal as a percentage:

(i) 0.25

$$\begin{aligned} &\Rightarrow 0.25 \times 100 \\ &= 25\% \end{aligned}$$

(v) 2.65

$$\begin{aligned} &\Rightarrow 2.65 \times 100 \\ &= 265\% \end{aligned}$$

(xii) 0.468

$$\begin{aligned} &\Rightarrow 0.468 \times 100 \\ &= 46.8\% \end{aligned}$$

2. Write the following percentages as decimals:

(i) 47%

$$\begin{aligned} &\Rightarrow \frac{47}{100} \\ &= 0.47 \end{aligned}$$

(v) 35%

$$\begin{aligned} &\Rightarrow \frac{35}{100} \\ &= 0.35 \end{aligned}$$

(xi) 24%

$$\begin{aligned} &\Rightarrow \frac{24}{100} \\ &= 0.24 \end{aligned}$$

(xviii) 174%

$$\begin{aligned} &\Rightarrow \frac{174}{100} \\ &= 1.74 \end{aligned}$$

## Exercise: 9.3

1. Change each fraction to a percent.

(i)  $\frac{4}{9}$

$$\begin{aligned} &= 0.444 \\ &= 0.444 \times 100 \\ &= 44.4\% \end{aligned}$$

(vi)  $\frac{5}{6}$

$$\begin{aligned} &= 0.833 \\ &= 0.833 \times 100 \\ &= 83.3\% \end{aligned}$$

(xi)  $\frac{13}{24}$

$$\begin{aligned} &= 0.541 \\ &= 0.541 \times 100 \\ &= 54.1\% \end{aligned}$$

(x)  $2\frac{1}{4} \Rightarrow \frac{9}{4}$

$$\begin{aligned} &= 2.25 \\ &= 2.25 \times 100 \\ &= 225\% \end{aligned}$$

## 2. Change the following percentages to fractions:

(i) 1%

$$= \frac{1}{100}$$

(v) 75%

$$\begin{aligned} &= \frac{75}{100} \\ &= \frac{3}{4} \text{ in lowest term} \end{aligned}$$

(vii) 66%

$$\begin{aligned} &= \frac{66}{100} \\ &= \frac{33}{50} \text{ in lowest term} \end{aligned}$$

(xii) 375%

$$\begin{aligned} &= \frac{375}{100} \\ &= \frac{15}{4} \text{ in lowest term} \end{aligned}$$

## Exercise: 9.4

### 1. Find the value of:

(i) 3% of 50

$$\begin{aligned} &= \frac{3}{100} \times 50 \\ &= \frac{3}{2} \\ &= 1.5 \end{aligned}$$

(vi) 30% of 24

$$\begin{aligned} &= \frac{30}{100} \times 24 \\ &= \frac{30}{25} \times 6 \\ &= \frac{36}{5} \\ &= 7.2 \end{aligned}$$

(xii) 20% of 60

$$\begin{aligned} &= \frac{20}{100} \times 60 \\ &= 2 \times 6 \\ &= 12 \end{aligned}$$

(xv) 55% of 470

$$\begin{aligned} &= \frac{55}{100} \times 470 \\ &= \frac{55}{10} \times 47 \\ &= \frac{11}{2} \times 47 \\ &= 258.5 \end{aligned}$$

### 2. Solve these:

(i) In a class of 60 student, 25% students received grade A. How many of the students received grade A?

Number of students = 60

Percentage of student recieved A = 25%



25% of 60

$$\begin{aligned} &= \frac{25}{100} \times 60 \\ &= \frac{1 \times 60}{4} \\ &= \frac{60}{4} \\ &= 15 \end{aligned}$$

(ii) In a certain office, the staff gets a bonus of 20% of pay on Eid. If Aman has a pay of 1500 rupees, how much bonus will he receive on Eid?

Aman's pay = 1500

Percentage of bonus = 20%

20% of 1500

$$\begin{aligned} &= \frac{20}{100} \times 1500 \\ &= 20 \times 15 \\ &= 300 \end{aligned}$$

(iii) In a town 65% of the people read newspaper. If the town has a population of 2000 people, how many people do not read newspaper?

Population = 2000

Percentage of News paper reader = 65%

65% of 2000

$$\begin{aligned} &= \frac{65}{100} \times 2000 \\ &= 20 \times 15 \\ &= 300 \end{aligned}$$

(iv) A son weighs 35% of his father's weight. If his father has a weight of 80 kg, how much does the son weigh?

Father weight = 80kg

Son's weight = 35% of father's weight

Son's weight = 35% of 80

$$\begin{aligned} &= \frac{35}{100} \times 80 \\ &= 7 \times 4 \end{aligned}$$

Son's weight = 28kg

(v) A company sold 6500 bars of soap in June. In July it could sell only 90% of the soaps it sold in June. How many bars of soap were sold in July?

$$\begin{aligned}\text{Sold in June} &= 6500 \\ \text{Sold in July} &= 90\% \text{ of June} \\ &= 90\% \text{ of } 6500 \\ &= \frac{90}{100} \times 6500 \\ &= 90 \times 65 \\ \text{Sold in July} &= 5850\end{aligned}$$

(vi) Ali spends 60% of his pocket money and saves the rest. If his pocket money is 250 rupees per month, how much money does he save every month?

$$\begin{aligned}\text{Pocket money} &= 250 \text{ rupees} \\ \text{Spending} &= 60\% \text{ of } 250 \\ &= 60\% \times 250 \\ &= \frac{60}{100} \times 250 \\ &= 6 \times 25 \\ \text{Spending} &= 150 \\ \text{Saving} &= \text{pocket money} - \text{spending} \\ \text{Saving} &= 250 - 150 \\ \text{Saving} &= 100 \text{ rupees}\end{aligned}$$

(vii) Mr. Kamal paid 4% of his yearly income as tax. If he has an annual income of 36,000 rupees, how much tax did he pay?

$$\begin{aligned}\text{Annual Income} &= \text{Rs. } 36000 \\ \text{Tax} &= 4\% \text{ of Income} \\ \text{Tax} &= 4\% \times 36000 \\ &= \frac{4}{100} \times 36000 \\ \text{Tax} &= 1440 \text{ rupees}\end{aligned}$$

(viii) Sana has 25 pairs of socks. 60% of the socks are white, and the rest are blue. How many pairs of socks are blue?

$$\begin{aligned}\text{Number of socks} &= 25 \text{ pairs } 60\% \text{ are white socks.} \\ \text{White socks} &= 60\% \text{ of socks} \\ &= \frac{60}{100} \times 25 \\ &= 3 \times 5 \\ \text{White socks} &= 15 \text{ pairs} \\ \text{Blue socks} &= \text{Totals socks} - \text{which socks} \\ &= 25 - 15 \\ \text{Blue socks} &= 10 \text{ pairs}\end{aligned}$$

(ix) Bina and Kiran had lunch in a restaurant. Kiran paid 20% of the bill whereas rest was paid by Bina. If the bill was of 125 rupees, how much amount did each of them pay?

Bill amount = Rs. 125

Percentage of bill paid by Kiran = 20%

20% of 125

$$= \frac{20}{100} \times 125$$

$$= \frac{2}{10} \times 125$$

Kiran paid Rs. = 25

Bina paid = Total Bill – Kiran paid

$$= 125 - 25$$

Bina paid = 100 rupees

(x) For a certain charitable fund, 50% of the amount collected was raised by men, 35% by women and 15% by children. If an amount of 20,000 rupees was collected, how much amount was raised?

(a) by men

(b) by women

(c) by children

Total fund = 20,000

(a) Shared by men = 50%

50% of 20,000

$$= \frac{50}{100} \times 20,000$$

$$= 50 \times 200$$

Men's share = 10,000 rupees

(b) Shared by women = 35%

35% of 20,000

$$= \frac{35}{100} \times 20,000$$

$$= 35 \times 200$$

Women's share = 7000 rupees

(c) Shared by children = 15%

= 15% of 20,000

$$= \frac{15}{100} \times 20,000$$

$$= 15 \times 200$$

Children's share = 3000 rupees

(xi) In a maths test containing 20 problems, Hina could solve 95% of the problems correctly. How many problems did she get wrong?

Number of problem = 20

Percentage of problem solved correctly = 95%

95% of 20

$$= \frac{95}{100} \times 20$$

Solved correctly = 19

incorrect/wrong = total problem – solved correctly

$$= 20 - 19$$

incorrect/wrong = 1

(xii) A car covered 68% of its journey at a high speed and the rest of the journey at a lower speed. If it covered a distance of 350 km, how many kilometers did it travel at a lower speed?

Total distance covered = 350km

Percentage of distance covered at high speed = 68%

Distance at high speed = 68% of 350

Son's weight = 35% of 80

$$= \frac{68}{100} \times 350$$

Distance covered at high speed = 238km

Distance covered at low speed = total distance – distance at high speed

$$= 350 - 238$$

Distance covered at low speed = 120km

(xiii) Ahmed bought shoes for 85% of their original price. If the shoes originally cost 275 rupees, how much did Ahmed pay?

Original price of shoes = Rs. 275

Percentage Ahmed Pay = 85%

Ahmed pay = 85% of 275

$$= \frac{85}{100} \times 275$$

Ahmed pay's = 233.75

(xiv) A newspaper boy sold 85% of the newspapers. If he had 80 newspapers, how many are left with him?

Number of newspaper = 80

Percentage of newspaper sold = 85%

Newspapers sold = 85% of 80

$$= \frac{85}{100} \times 80$$

Newspapers sold = 68

(xv) The population of a city A now is 120% of what it was in 1970. If the population of the city in 1970 was 25,000. What is its population now?

Population of city A in 1970 = 25000

Percentage of city now = 120%

Population now = 120% of 25000

$$= \frac{120}{100} \times 25000$$

Population now = 30,000

## Exercise: 9.5

### 1. What percent of:

(i) 20kg is 10kg

**Solution**

$$= \frac{10}{20} \times 100$$

$$= 50\%$$

(v) 256 minutes is 16 minutes

**Solution**

$$= \frac{16}{256} \times 100$$

$$= 6.25\%$$

(2) Last week it rained for 3 days. What percent of the days last week did it rain?

**Solution**

$$= \frac{3}{7} \times 100$$

$$= 42.85\%$$

(3) A hockey team won 6 out of the 10 matches played. What percent of the matches did it win?

**Solution**

$$= \frac{6}{10} \times 100 \quad \Rightarrow 60\%$$

(4) A shirt was sold in a sale for 48 rupees. Its original cost was 64 rupees. What percent of the original cost was the shirt sold for?

**Solution**

$$= \frac{48}{64} \times 100$$

$$= 75\%$$

(5) A class collected 75 plastic cans for a class project. 27 cans were collected by girls. What percent of the cans were collected by girls?

**Solution**

$$= \frac{27}{75} \times 100$$

$$= 20.25\%$$

(6) The schedule of shifts in a factory is as follows:

Number of workers	Timings
45	8:00 A.M. to 4:00 P.M
20	4:00 P.M. to 12:00 A.M
15	12:A.M. to 8:00 P.M

(i) What percent of workers work from 8:00 A.M. To 4:00 P.M.?

**Solution**

$$= \frac{45}{80} \times 100$$

$$= 56.25\%$$

(ii) What percent of workers work from 4:00 P.M. TO 12:00 A.M.?

**Solution**

$$= \frac{20}{80} \times 100$$

$$= 25\%$$

(iii) What percent of workers work from 12:00 A.M. To 8:00 A.M.?

**Solution**

$$= \frac{15}{80} \times 100$$

$$= 18.75\%$$

(7) In a university department the students belonging to different countries are as follows:

Nationality	Numbers of Students
Pakistani	95
Arabs	5
Chinese	2
Europeans	18

**Solution**

$$95 + 5 + 2 + 18 = 120$$

$$\text{Percentage of Pakistani Student} = \frac{95}{120} \times 100$$

$$= 79.1\%$$

(8) A certain type of food has 150 grams of fats, 400 grams of carbohydrates and 200 grams of proteins.

(i) What percent of the food consists of fats?

$$\text{Percentage of fats} = \frac{150}{700} \times 100$$

$$= 21.4\%$$

(ii) What percent of the food consists of carbohydrates?

$$\begin{aligned}\text{Percentage of carbohydrates} &= \frac{400}{700} \times 100 \\ &= 57.14\%\end{aligned}$$

(iii) What percent of the food consists of proteins?

$$\begin{aligned}\text{Percentage of proteins} &= \frac{200}{700} \times 100 \\ &= 28.57\%\end{aligned}$$

(9) There is a hole in a 50 kg sugar bag. Rats eat  $\frac{1}{2}$  kg of sugar every day. After 12 days, what percent of the sugar has been eaten by the rats?

**Solution**

Sugar eat by rats =  $0.5 \times 12$

Sugar eat by rats = 6kg

$$= \frac{6}{50} \times 100 = 12\%$$

(10) Mr. Karim invested Rs. 15,000 from his money in an investment company and bought shares with Rs. 30,000 if he had Rs. 75,000.

(i) What percent of his money did he invest in the investment company?

$$\begin{aligned}\text{Percentage of money invested in company} &= \frac{15000}{70000} \times 100 \\ &= 21.42\%\end{aligned}$$

(ii) With what percent of his money did he buy the shares?

$$\begin{aligned}\text{Percentage of money invested in share} &= \frac{30,000}{70,000} \times 100 \\ &= 42.85\%\end{aligned}$$

## Exercise: 9.6

(1) If old price of a product is Rs. 500 and its new price is Rs. 600, find the increase in price and its percentage increase?

**Solution**

Old price = Rs. 500

New Price = 600

$$\begin{aligned}\text{Difference in prices} &= \text{New price} - \text{Old price} \\ &= 600 - 500\end{aligned}$$

Difference in prices = 100

$$\begin{aligned}\text{Percentage increase} &= \frac{\text{Difference}}{\text{Old price}} \times 100 \\ &= \frac{100}{500} \times 100\end{aligned}$$

Percentage = 20%

(2) If old price of a product is Rs. 1400 and its new price is Rs. 1500, find the increase in price and its percentage increase?

**Solution**

Old price = Rs. 1400

New Price = Rs. 1500

Price difference = New price – Old price  
= 1500 – 1400

Difference in prices = Rs. 100

Percentage increase =  $\frac{100}{1400} \times 100$

Percentage increase = 7.14%

(3) The price of a book was Rs. 700. The price was increased by 12 %. How much does the book cost after the price increase?

**Solution**

Price increased = 12% of 700

Price increase =  $\frac{12}{100} \times 700$

Price increase = Rs. 84

Current price = Old price + Price increase  
= 700 + 84

Current price = Rs. 784

(4) The price of a fan was Rs. 1800. The price was increased by 8 %. How much does the fan cost after the price increase?

**Solution**

Price increased = 8% of 1800

Price increase =  $\frac{8}{100} \times 1800$

Price increase = Rs. 144

Price of fan after increase = Old price + Price increase  
= 1800 + 144

Price after increased = Rs. 1944

(5) The price of ice-cream decreased from Rs. 120 to Rs. 90. What was the percentage decrease?

**Solution**

Old price = Rs. 120

New price = Rs. 90

Price decreased = Old price – New price  
= 120 – 90

Price decreased = Rs. 30

Percentage decreased =  $\frac{30}{120} \times 100$

Percentage decreased = 25%



(6) The price of bat decreased from Rs. 370 to Rs. 335. What was the percentage decrease?

**Solution**

$$\begin{aligned}\text{Price decreased} &= \text{Old price} - \text{New price} \\ &= 370 - 335\end{aligned}$$

$$\text{Price decreased} = \text{Rs. } 35$$

$$\text{Percentage decreased} = \frac{35}{370} \times 100$$

$$\text{Percentage decreased} = 9.45\%$$

(7) The price of a juice was Rs. 175. The price was discounted by 17%. How much does the juice cost after the discount?

**Solution**

$$\text{Old price} = \text{Rs. } 175$$

$$\text{Discount} = 17\%$$

$$\text{Discounted Amount} = 17\% \text{ of } 175$$

$$= \frac{17}{100} \times 175$$

$$\text{Discounted Amount} = 29.75$$

$$\text{Discounted price} = 175 - 29.75$$

$$\text{Discounted price} = 145.25$$

(8) The price of a burger was Rs. 210. The price was discounted by 10%. How much does the burger cost after the discount?

**Solution**

$$\text{Old price} = \text{Rs. } 210$$

$$\text{Discount} = 10\%$$

$$\text{Discounted Amount} = 10\% \text{ of } 210$$

$$= \frac{10}{100} \times 210$$

$$\text{Discounted amount} = 21$$

$$\text{Discounted price} = \text{Old price} - \text{Discounted price}$$

$$\text{Discounted price} = 210 - 21$$

$$\text{Discounted price} = \text{Rs. } 189$$

## Profit and Loss

### Exercise: 10.1

#### 1. Find the profit or loss.

(i) C.P = Rs. 500      S.P = Rs. 800

**Solution:**

$$\text{Profit/Loss} = \text{S.P} - \text{C.P}$$

$$\text{Profit/Loss} = 800 - 500$$

$$\text{Profit} = 300$$

(Positive answer represents profit)

(ii) C.P = Rs. 230      S.P = Rs. 210

**Solution:**

$$\text{Profit/Loss} = \text{S.P} - \text{C.P}$$

$$\text{Profit/Loss} = 210 - 230$$

$$\text{Loss} = -2$$

(Negative answer represent loss)

(v) C.P = Rs. 98      S.P = Rs. 52

**Solution:**

$$\text{Profit/Loss} = \text{S.P} - \text{C.P}$$

$$\text{Profit/Loss} = 52 - 98$$

$$\text{Loss} = -46$$

(Negative answer represent loss)

#### 2. Find the selling price.

(i) C.P = Rs. 145      Profit = Rs. 15

**Solution:**

$$\text{Selling price} = \text{C.P} + \text{Profit}$$

$$\text{S.P} = 145 + 15$$

$$\text{S.P} = 160$$

(ii) C.P = Rs. 244      Loss = Rs. 14

**Solution:**

$$\text{S.P} = \text{C.P} - \text{loss}$$

$$\text{S.P} = 244 - 14$$

$$\text{S.P} = 230$$

(v) C.P = Rs. 528      Loss = Rs. 12

**Solution:**

$$\text{S.P} = \text{C.P} - \text{Loss}$$

$$\text{S.P} = 528 - 12$$

$$\text{S.P} = 516$$

#### 3. Find the cost price

(i) S.P = Rs. 105      Loss = Rs. 12

**Solution:**

$$\text{C.P} = \text{S.P} + \text{Loss}$$

$$\text{C.P} = 105 + 12$$

$$\text{C.P} = 117$$

(ii) S.P = Rs. 218      Profit = Rs. 12

**Solution:**

$$\text{C.P} = \text{S.P} - \text{Profit}$$

$$\text{C.P} = 218 - 12$$

$$\text{C.P} = 206$$

(v) S.P = Rs. 316      Loss = Rs. 20

**Solution:**

$$\text{C.P} = \text{S.P} + \text{Loss}$$

$$\text{S.P} = 316 + 20$$

$$\text{C.P} = 336$$

## Exercise: 10.2

### 1. Find the gain or loss percent.

(i) C.P = Rs. 50      S.P = Rs. 60

**Solution:**

$$\text{Profit/Loss} = \text{S.P} - \text{C.P}$$

$$\text{Profit/Loss} = 60 - 50$$

$$\text{Profit} = 10$$

$$\text{Profit\%} = \frac{\text{Profit}}{\text{C.P}} \times 100$$

$$\text{Profit\%} = \frac{10}{50} \times 100 = 20\%$$

$$\text{Profit\%} = 20\%$$

### 2. Find the selling price

(i) C.P = Rs. 24      Profit = 20%

**Solution:**

Step # 1 Find the amount of profit

$$\text{Profit\%} = \frac{\text{Profit}}{\text{C.P}} \times 100$$

$$20\% = \frac{\text{Profit}}{24} \times 100$$

$$\text{Profit} = \frac{20}{100} \times 24$$

$$\text{Profit} = \text{Rs. } 4.8$$

Step # 2 Now Find the S.P

$$\text{S.P} = \text{C.P} + \text{Profit}$$

$$\text{S.P} = 24 + 4.8$$

$$\text{S.P} = \text{Rs. } 28.8$$

### 3. Find the cost price

(i) S.P = Rs. 125      Profit = 25%

**Solution:**

$$\text{Formula} \quad \text{C.P} = \left( \frac{100}{100 + \text{Profit\%}} \right) \times \text{S.P}$$

$$\text{C.P} = \left( \frac{100}{100 + 25} \right) \times 125$$

$$\text{C.P} = 0.8 \times 125$$

$$\text{C.P} = \text{Rs. } 100$$

(iv) C.P = Rs. 20      S.P = Rs. 19.50

**Solution:**

$$\text{Profit/Loss} = \text{S.P} - \text{C.P}$$

$$\text{Profit/Loss} = 19.50 - 20$$

$$\text{Loss} = -0.50$$

$$\text{Loss\%} = \frac{\text{Loss}}{\text{C.P}} \times 100$$

$$\text{Loss\%} = \frac{0.5}{20} \times 100 = 2.5\%$$

$$\text{Loss\%} = 2.5\%$$

(iv) C.P = Rs. 350      Loss = 5%

**Solution:**

Step # 1 Find the amount of loss

$$\text{Loss\%} = \frac{\text{Loss}}{\text{C.P}} \times 100$$

$$5\% = \frac{\text{Loss}}{350} \times 100$$

$$\text{Loss} = \frac{5}{100} \times 350$$

$$\text{Loss} = \text{Rs. } 17.5$$

Step # 2 Now Find the S.P

$$\text{S.P} = \text{C.P} - \text{Loss}$$

$$\text{S.P} = 350 - 17.5$$

$$\text{S.P} = \text{Rs. } 332.5$$

(ii) S.P = Rs. 675      Loss = 10%

**Solution:**

$$\text{C.P} = \left( \frac{100}{100 - \text{Loss\%}} \right) \times \text{S.P}$$

$$\text{C.P} = \left( \frac{100}{100 - 10} \right) \times 675$$

$$\text{C.P} = 1.11 \times 675$$

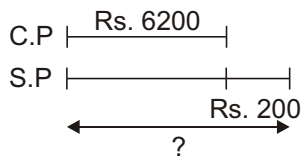
$$\text{C.P} = \text{Rs. } 750$$

## Word Problem

4. Draw diagrams wherever you are not sure; the first has been drawn for you.

A cycle was bought for Rs. 6200 and sold at a gain of Rs. 200

Find the selling price of the cycle.



**Data:**

$$C.P = 6200$$

$$\text{Profit} = 200$$

$$S.P = ?$$

**Solution:**

$$S.P = C.P + \text{Profit}$$

$$S.P = 6200 + 200$$

$$S.P = 6400$$

5. A table was bought for Rs. 2000 and sold at a loss of Rs. 150. Find the selling price of the table.

**Data:**

$$C.P = \text{Rs. } 2000$$

$$\text{Loss} = \text{Rs. } 150$$

$$S.P = ?$$

**Solution:**

$$S.P = C.P - \text{Profit}$$

$$S.P = 2000 - 150$$

$$S.P = \text{Rs. } 1850$$

6. By selling a refrigerator for Rs. 40800, Mrs. Haris had a loss of Rs. 3500. Find the price Mrs. Haris had paid for her refrigerator.

**Data:**

$$S.P = 40800$$

$$\text{Loss} = 3500$$

$$C.P = ?$$

**Solution:**

$$C.P = S.P + \text{Loss}$$

$$C.P = 40800 + 3500$$

$$C.P = \text{Rs. } 44300$$

7. A milkman bought milk at Rs. 75 per litre and sold it at Rs. 85 per litre. Find his gain percent.

**Data:**

$$C.P = 75$$

$$S.P = \text{Rs. } 85$$

$$\text{Profit}\% = ?$$

**Solution:**

Step # 1 Find the profit amount

$$\text{Profit} = \text{S.P} - \text{C.P}$$

$$\text{Profit} = 85 - 75$$

$$\text{Profit} = 10$$

Step # 2 Now find profit%

$$\text{Profit}\% = \frac{\text{Profit}}{\text{C.P}} \times 100$$

$$\text{Profit}\% = \frac{10}{75} \times 100$$

$$\text{Profit} = 13.33\%$$

8. 1 packet of butter was bought for Rs. 450 and sold for Rs. 422. Find the loss percent.

**Data:**

$$\text{C.P} = \text{Rs. } 450$$

$$\text{S.P} = \text{Rs. } 422$$

$$\text{Loss percent} = ?$$

**Solution:**

Step # 1 find the loss amount

$$\text{Loss} = \text{C.P} - \text{S.P}$$

$$= 450 - 422$$

$$\text{Loss} = 28$$

Step # 2 Now find loss%

$$\text{Loss}\% = \frac{\text{Loss}}{\text{C.P}} \times 100$$

$$\text{Profit}\% = \frac{28}{450} \times 100$$

$$\text{Loss}\% = 6.22\%$$

9. A bicycle bought for Rs. 4500 is sold at a loss of 5%. Find the selling price.

**Data:**

$$\text{C.P} = \text{Rs. } 4500$$

$$\text{Loss}\% = 5\%$$

Step # 2 Now find S.P

$$\text{S.P} = \text{C.P} - \text{Loss}$$

$$\text{S.P} = 4500 - 225$$

$$\text{S.P} = 4275$$

**Solution:**

Step # 1 Find the loss amount

$$\text{Loss}\% = \frac{\text{Loss}}{\text{C.P}} \times 100$$

$$5\% = \frac{\text{Loss}}{4500} \times 100$$

$$\text{Loss} = \frac{5}{100} \times 4500$$

$$\text{Loss} = 225$$

## Basics of Geometry

### Exercise: 11.1

Identify each figure line segment, line and ray.

- (i) Ray    (ii) Line Segment    (iii) Line Segment    (iv) Line    (v) Ray    (vi) Line

### Exercise: 11.2

1. Measure the angles.

- (i)  $60^\circ$     (ii)  $90^\circ$     (iii)  $110^\circ$     (iv)  $30^\circ$     (v)  $130^\circ$     (vi)  $170^\circ$

2. Measure the angles using your protractor.

- (i)  $45^\circ$     (ii)  $70^\circ$     (iii)  $135^\circ$     (iv)  $90^\circ$     (v)  $30^\circ$     (vi)  $85^\circ$

### Exercise: 11.3

1. Identify each angle as right angle, acute angle or obtuse angle.

- (i) Right angle    (ii) Obtuse angle    (iii) Obtuse angle    (iv) Acute angle  
(v) Right angle    (vi) Acute angle

2. Find the supplement of the following angles.

(i)  $x + 90^\circ$

$$x + 90^\circ = 180^\circ$$

$$x = 180^\circ - 90^\circ$$

$$x = 90^\circ$$

Supplementary angle of  $90^\circ$  is  $90^\circ$

(vi)  $c + 85^\circ$

$$c + 85^\circ = 180^\circ$$

$$c = 180^\circ - 85^\circ$$

$$c = 95^\circ$$

Supplementary angle of  $85^\circ$  is  $95^\circ$

(iii)  $a + 145^\circ$

$$a + 145^\circ = 180^\circ$$

$$a = 180^\circ - 145^\circ$$

$$a = 35^\circ$$

Supplementary angle of  $145^\circ$  is  $35^\circ$

3. Find the complements of the following angles.

(i)  $x + 25^\circ$

$$x + 25^\circ = 90^\circ$$

$$x = 90^\circ - 25^\circ$$

$$x = 65^\circ$$

Complementary angle of  $25^\circ$  is  $65^\circ$

(vi)  $z + 20^\circ$

$$z + 20^\circ = 90^\circ$$

$$z = 90^\circ - 20^\circ$$

$$z = 70^\circ$$

Complementary angle of  $20^\circ$  is  $70^\circ$

(iii)  $y + 48^\circ$

$$y + 48^\circ = 90^\circ$$

$$y = 90^\circ - 48^\circ$$

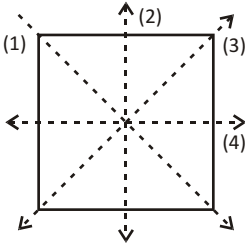
$$y = 42^\circ$$

Complementary angle of  $48^\circ$  is  $42^\circ$

### Exercise: 11.4

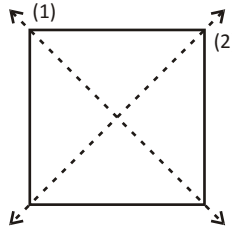
Identify the line of symmetry of the following quadrilaterals.

(i) Square



Square has 4 line of symmetry

(ii) Rhombus



Rhombus has 2 line of symmetry

### Exercise: 11.5(a)

Identify the following triangles as Acute angle, Obtuse angled or Right angled.

See the answers from answer book.

### Exercise: 11.5(b)

(i) In the  $\triangle ABC$  find  $\angle ABC$  when  $\angle BAC = 35^\circ$  and  $\angle BCA = 35^\circ$ .

**Solution:**

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

$$\angle ABC + 35^\circ + 35^\circ$$

$$\angle ABC = 180^\circ - 70^\circ$$

$$\angle ABC = 110^\circ$$

(iii) In the right angled triangle find  $\angle MLN$  when  $\angle MNL = 45^\circ$

**Solution:**

If triangle is right angled one of the three angles must be  $90^\circ$

$$\angle MLN + \angle MNL + 90^\circ = 180^\circ$$

$$\angle MLN + 45^\circ + 90^\circ = 180^\circ$$

$$\angle MLN = 180^\circ - 135^\circ$$

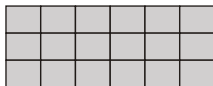
$$\angle MLN = 45^\circ$$

## Area

## Exercise: 12.1

1. What is the area of each of these rectangles drawn? Each small square =  $1 \text{ cm}^2$

(i)



Area of 1 small box =  $1 \text{ cm}^2$  which means the height and width of box is 1 cm each.

$$\text{Area} = h \times w$$

$$\text{Area} = 3 \text{ cm} \times 6 \text{ cm}$$

$$\text{Area} = 18 \text{ cm}^2$$

(vi)

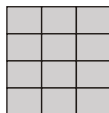


$$\text{Area} = h \times w$$

$$\text{Area} = 4 \text{ cm} \times 6 \text{ cm}$$

$$\text{Area} = 24 \text{ cm}^2$$

(viii)



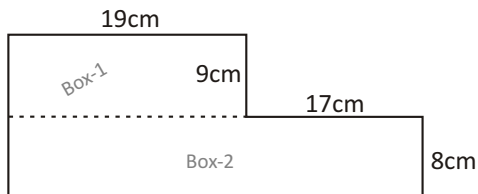
$$\text{Area} = h \times w$$

$$\text{Area} = 4 \text{ cm} \times 3 \text{ cm}$$

$$\text{Area} = 12 \text{ cm}^2$$

2. Calculate the area of these shapes.

(ii)



Area of box 1 = h of box 1 x w of box 1

$$\text{Area of box 1} = 9 \text{ cm} \times 19 \text{ cm}$$

$$\text{Area of box 1} = 171 \text{ cm}^2$$

Area of box 2 = h of box 2 x w of box 2

$$\therefore \text{w of box 2} = 17 \text{ cm} + 19 \text{ cm} = 36 \text{ cm}$$

$$\text{Area of box 2} = 36 \text{ cm} \times 8 \text{ cm}$$

$$\text{Area of box 2} = 288 \text{ cm}^2$$

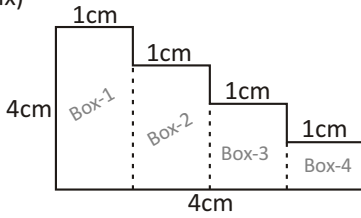
$$\text{Area} = A_1 + A_2$$

$$= 171 + 288$$

$$= 459 \text{ cm}^2$$



(ix)



$$\text{Area of box1} = w_1 \times h_1$$

$$\text{Area of box1} = 1\text{cm} \times 4\text{cm}$$

$$\text{Area of box1} = 4\text{cm}^2$$

$$\text{Area of box2} = w_2 \times h_2$$

$$\text{Area of box2} = 1\text{cm} \times (4 - 1)\text{cm}$$

$$\text{Area of box2} = 1\text{cm} \times 3\text{cm}$$

$$\text{Area of box2} = 3\text{cm}^2$$

$$\text{Area of box3} = w_3 \times h_3$$

$$\text{Area of box3} = 1\text{cm} \times (4 - 2)\text{cm}$$

$$\text{Area of box3} = 1\text{cm} \times 2\text{cm}$$

$$\text{Area of box3} = 2\text{cm}^2$$

$$\text{Area of box4} = w_4 \times h_4$$

$$\text{Area of box4} = 1\text{cm} \times (4 - 3)\text{cm}$$

$$\text{Area of box4} = 1\text{cm} \times 1\text{cm}$$

$$\text{Area of box4} = 1\text{cm}^2$$

$$\text{Total Area} = A_1 + A_2 + A_3 + A_4$$

$$= 4 + 3 + 2 + 1$$

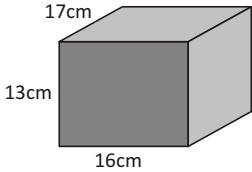
$$= 10\text{cm}^2$$

## Volume

### Exercise: 13.1(a)

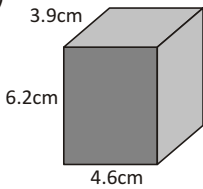
1. Calculate the volume of these cuboids.

(i)



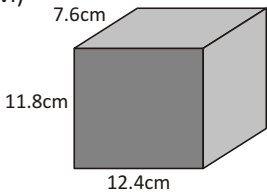
$$\begin{aligned} \text{Volume} &= l \times w \times h \\ V &= 17 \times 16 \times 13 \\ V &= 3536\text{cm}^3 \end{aligned}$$

(iv)



$$\begin{aligned} \text{Volume} &= l \times w \times h \\ V &= 3.9 \times 4.6 \times 6.2 \\ V &= 111.23\text{cm}^3 \end{aligned}$$

(vi)

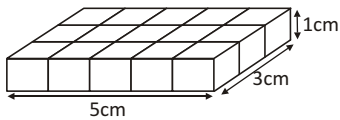


$$\begin{aligned} \text{Volume} &= l \times w \times h \\ V &= 7.9 \times 12.4 \times 11.8 \\ V &= 1155.92\text{cm}^3 \end{aligned}$$

### Exercise: 13.1(b)

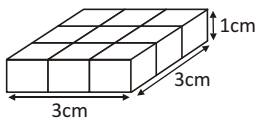
Find the volume of each shape.

(i)



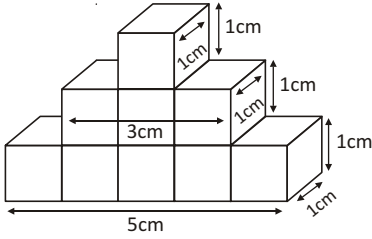
$$\begin{aligned} \text{Volume} &= l \times w \times h \\ V &= 3 \times 5 \times 1 \\ V &= 15\text{cm}^3 \end{aligned}$$

(ii)



$$\begin{aligned} \text{Volume} &= l \times w \times h \\ V &= 3 \times 3 \times 1 \\ V &= 9\text{cm}^3 \end{aligned}$$

(v)



Total volume =  $5 + 3 + 1 = 9\text{cm}^3$

Volume of lowest part  $V = l \times w \times h$   
 $V = 1 \times 5 \times 1$   
 $V = 5\text{cm}^3$

Volume of middle part  $V = l \times w \times h$   
 $V = 1 \times 3 \times 1$   
 $V = 3\text{cm}^3$

Volume of top part  $V = l \times w \times h$   
 $V = 1 \times 1 \times 1$   
 $V = 1\text{cm}^3$

## Chapter 14

# Graphs

### Exercise: 14.1

2. Five children went to sea-side on a week-end. The number of sea-shells collected by every student is shown in the table below.

Name of child	Number of shells collected
Kiran	14
Ali	24
Hina	15
Omar	22
Sana	20

Show this data on a pictograph.

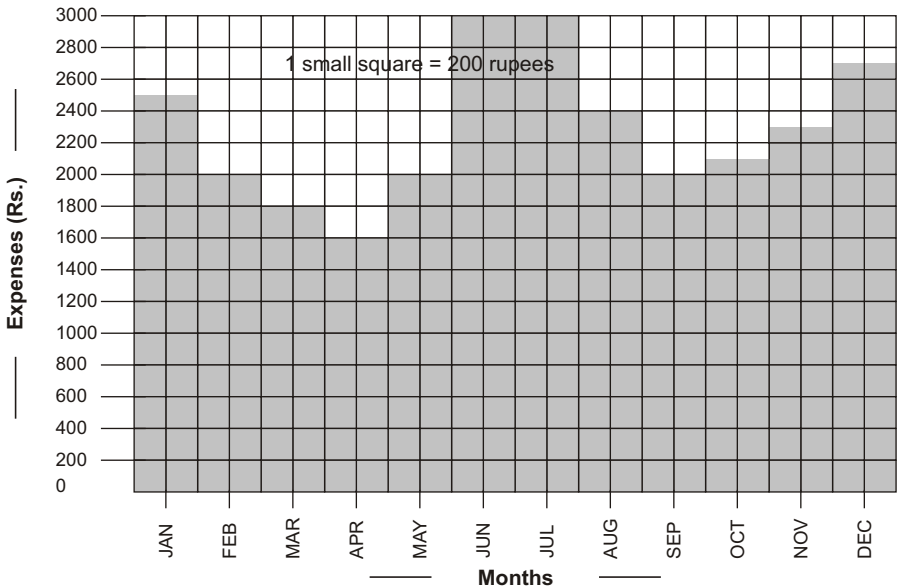
Name of child	Pictograph
Kiran	
Ali	
Hina	
Omar	
Sana	

Mrs. Kamal has recorded her monthly expenditures on a particular item for the year, 2015 as follows.

Month	Expenditure (Rs)	Month	Expenditure (Rs)
January	2,500	July	3,000
February	2,000	August	2,400
March	1,800	September	2,000
April	1,500	October	2,100
May	2,000	November	2,300
June	3,000	December	2,700

Show this data in the form of a bar graph.

Months have been marked on horizontal axes and expenditure on vertical axes. (first month has been done for you)



**2. Answer these questions:**

(i) In which month did she spend the most?

Ans: June and July

(ii) In which month did she spend the least?

Ans: April

(iii) What was her average expenditure per month?

Ans:  $\frac{(2500 + 2000 + 1800 + 1500 + 2000 + 3000 + 3000 + 2400 + 2000 + 2100 + 2300 + 2700)}{12} = 275$

(iv) What was the mean of her monthly expenditure?

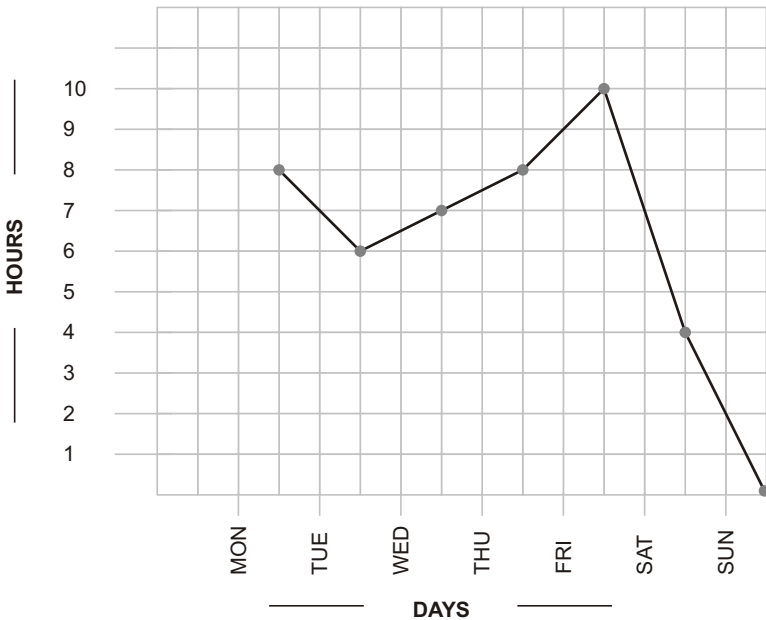
Ans: 275

(v) What was the mode of her monthly expenditure?

Ans: 2000 (most repeated)

### Exercise: 14.3

A painter kept a record of his work-time during a certain week. This record has been shown on the following line graph.



Sunday is a holiday hence his work-time on Sunday is 0.

#### 1. Answer these questions after studying the graph.

(i) For how many hours did he work on Monday?

Ans: 8

(ii) What was the maximum number of hours that he worked in a day?

Ans: 10

(iii) On how many days did he work more than 7 hours?

Ans: 3

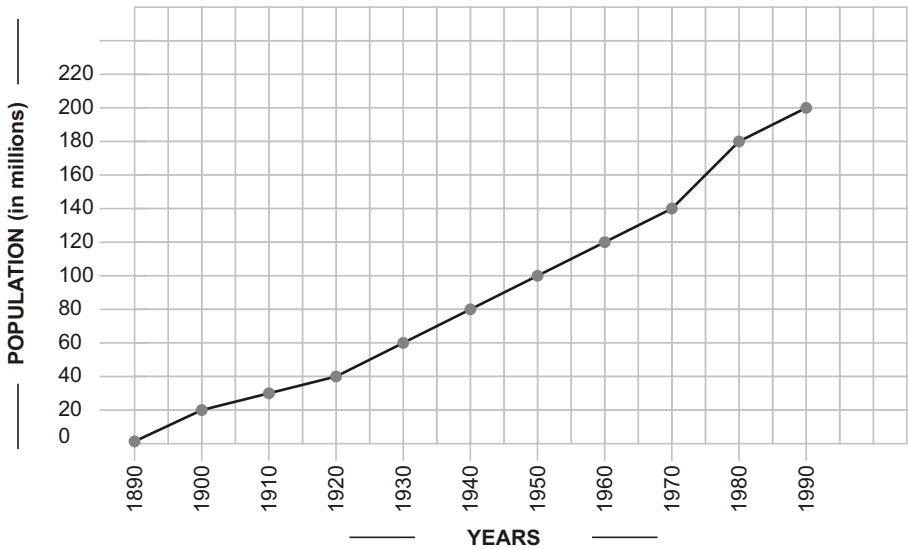
(iv) For how many total hours did he work during the week?

Ans: 43

(v) What was the average number of hours that he worked per day for Saturday, Sunday and Monday?

Ans: 4

The population of a country x during the years 1890 to 1990 is shown in the graph below.



**2. Answer the following Questions:**

(i) What does the horizontal scale show?

Ans: Years

(ii) What does the vertical scale show?

Ans: Population

(iii) What was the population of the country in 1930?

Ans: 60 million

(iv) What was the population of the country in 1970?

Ans: 140 million

(v) The population in 1990 is how many times the population in 1920?

Ans: 5 times