Exercise - 9.1

1. (i) Yes, As both are quantities

(ii) No, As one is weight and other is quantity

(iii) No, As one is time and other is distance covered.

(iv) Yes, As both are quantities.

(v) No, As one is length and other is temperature.

2) (i) $\frac{12}{24} = \frac{1}{2}$ Ratio 1:2

(ii) $\frac{78}{13} = \frac{6}{1}$ Ratio 6:1

2(iii) $\frac{₹54}{₹6.75} = \frac{8}{1}$ Ratio = 8:1

(iv) $\frac{12g}{15g} = \frac{4}{5}$ Ratio 4:5

(v) $\frac{36L}{54L} = \frac{2}{3}$ Ratio 2:3

(vi) $\frac{950m}{9500m} = \frac{1}{100}$ Ratio 1::100

(vii) $\frac{360g}{504g} = \frac{2\cancel{4}\times\cancel{2}\times\cancel{3}\times\cancel{3}\times\cancel{5}}{\cancel{7}\times\cancel{7}\times\cancel{2}\times\cancel{3}\times\cancel{3}\times\cancel{7}} = \frac{5}{7}$ Ratio 5:7

360	504
180	252
90	126
45	63
9	21
3	7
1	1

(viii) 1 h 24 min $= 60+24 = 84$ min.

6 h 18 min $= 360+18 = 378$ min.

$\frac{84}{378} = \frac{\cancel{2}\times\cancel{2}\times\cancel{3}\times\cancel{7}}{\cancel{2}\times\cancel{3}\times\cancel{3}\times\cancel{3}\times\cancel{7}} = \frac{2}{9}$ Ratio 2:9

84	378
42	189
21	63
7	21
1	7
	1

(ix) 58p : ₹1.45

₹1.45 = 145p

$\frac{2\cancel{58}p}{\cancel{145}p\ 5} = \frac{2}{5}$

ratio 2:5.

(x) 1 h 45 min 20 sec

$= 60\times60 + 45\times60 + 20$

$= 3600 + 2700 + 20$

$= 3600 + 2900$

$= 6500$

∴ Ratio $\frac{5\times4}{6500} = \frac{1}{125}$ Ratio 1:125.

3

	Antecedent	Consequent
(i)	1	2
(ii)	6	1
(iii)	8	1
(iv)	4	5

4) Orange concentrate = 125 mL

Orange Drink = 300 mL

Water used = 300 − 125

= 175 mL

(i) $\frac{125}{300} = \frac{5}{12}$ Ratio 5:12

(ii) $\frac{125}{175} = \frac{5}{7}$ Ratio 5:7

(iii) $\frac{300}{175} = \frac{12}{7}$ Ratio 12:7

(iv) $\frac{175}{125} = \frac{7}{5}$ Ratio 7:5

(v) $\frac{300}{125} = \frac{12}{5}$ Ratio 12:5.

5) $\frac{\text{Gold}}{\text{Silver}} = \frac{3}{5}$.

Gold = 855 mg.

$\frac{855}{\text{silver}} = \frac{3}{5}$

$\text{Silver} = \frac{855 \times 5}{3} = 285 \times 5$

= 1425 mg.

= 1 g 425 mg

6) $\frac{\text{Earning of Joy's Mother}}{\text{Earning of Joy's Father}} = \frac{7}{8}$.

Joy's Father Earns = ₹12,640.

$$\frac{\text{Joy's Mother}}{12640} = \frac{7}{8}.$$

Joy's Mothers earning $= 12640 \times \frac{7}{8}$

$= 1580 \times 7$

$= ₹11060$ / month. Ans

7) Ratio is 6 : 11

Total Share $= 6 + 11 = 17$

Total cookies $= 85$.

Ajay's share $= \frac{6}{17} \times 85$

$= 30$ cookies Ans

Anju's share $= \frac{11}{17} \times 85$

$= 55$ cookies Ans

30, 55 cookies total

8) $\frac{\text{Length}}{\text{Breadth}} = \frac{7}{5}$.

Length $= 112$ m.

$\frac{112}{\text{Breadth}} = \frac{7}{5}$.

$\text{Breadth} = \frac{16}{\cancel{112} \times 5}{\cancel{7}}$

$= 80$ m

Perimeter $= 2(l+b)$

$= 2(112+80)$

$= 2 \times 192 = 384$ m. Ans

9) Total ratio $= 2+3+4 = 9$

Perimeter $= 99$ cm.

Ex-9.1 6/9/16.

9) Length of one side $= \frac{2}{9} \times 99$

$= 22$ cm.

Length of second side $= \frac{3}{9} \times 99$

$= 33$ cm.

Length of Third side $= \frac{4 \times 99}{9} = 44$ cm.

22cm, 33cm, 44cm Ans

10) Total Ratio $= 7+8+9 = 24$

Total Money $= 1560$.

First share $= \frac{7}{24} \times 1560$

$= 7 \times 65 = 455$

Second share $= \frac{8}{24} \times 1560 = 8 \times 65$

$= ₹520$

Third share $= \frac{9}{24} \times 1560 = 9 \times 65$

$= ₹585$

₹455, ₹520, ₹585 Ans

11) Total Ratio $= 12+11+10 = 33$

Red Bulbs $= \frac{12}{33} \times 4752$

$= 12 \times 144$

$= 1728$ bulbs

Blue Bulbs $= \frac{11}{33} \times 4752$

$= 11 \times 144$

$= 1584$ bulbs

Ex - 9.1 6/9/17.

Yellow Bulbs = $\frac{10}{33} \times 4752$

$= 10 \times 144$

$= 1440$ bulbs.

Red Blue Yellow
1728, 1584, 1440 Ans

Exercise - 9.2

1 (i) 1:1 and 7:7

or $\frac{1}{1}$ and $\frac{7}{7}$

By cross multiplication.

$1 \times 7 = 7$

$1 \times 7 = 7$

as $7 = 7$, $\therefore$ Ratios are in proportion.

(Yes)

Ex-9.2 6/9/10.

1(ii) 1:7 and 7:1

or $\frac{1}{7}$ and $\frac{7}{1}$

cross multiply.

$1 \times 1 = 1$

$7 \times 7 = 49$

As $1 \neq 49$, The ratios are not in proportion (NO)

(iii) 2:6 and 13:39.

or $\frac{2}{6}$ and $\frac{13}{39}$

By cross multiplication

$2 \times 39 = 78$

$6 \times 13 = 78$.

As $78 = 78$, The ratios are in proportion (Yes)

(iv) 17:19 and 15:17.

$\frac{17}{19}$ and $\frac{15}{17}$

By Cross multiplication

$17 \times 17 = 289$.

$15 \times 19 = 285$

As $289 \neq 285$, Hence they are not in proportion (NO)

(v) 3.2:4 and 8:10.

$\frac{3.2}{4}$ and $\frac{8}{10}$

By Cross multiplication.

$3.2 \times 10 = 32$

$4 \times 8 = 32$

As $32 = 32$, Hence ratios are in proportion. (Yes)

1(vi) 8 : 5 and 11 : 6.875.

or $\frac{8}{5}$ and $\frac{11}{6.875}$

By cross multiplication.

$8 \times 6.875 = 55$.

$11 \times 5 = 55$.

As $55 = 55$, Hence ratios are in proportion. (Yes)

2(i) 5 : 10 & 15 : 30

To be in proportion.

The product of extremes should be equal to product of means.

Product extremes $= 5 \times 30 = 150$.

Product of means $= 10 \times 15 = 150$.

As both are equal hence in proportion

(ii) 2 : 4 & 6 : 8

Product of extremes $= 2 \times 8 = 16$.

Product of means $= 4 \times 6 = 24$.

As $16 \neq 24$

They are not in proportion.

(iii) 24 : 6 and 108 : 27

Product of extremes $= 24 \times 27 = 648$

Product of means $= 108 \times 6 = 648$

As $648 = 648$

Hence they are in proportion.

(iv) 1·1 : 2·2 and 3·3 : 9·9.

Product of extremes $= 1.1 \times 9.9 = 10.89$

Product of means $= 2.2 \times 3.3 = 7.26$

As $10.89 \neq 7.26$

Ex-9.2 6/9/12

2(iv) They are not in proportion.

2(v) 1.1 : 2.2 and 3.3 : 6.6.

Product of extremes = $1.1 \times 6.6 = 7.26$

Product of means $= 2.2 \times 3.3 = 7.26$

As $7.26 = 7.26$

Hence they are in proportion.

(vi) $\frac{1}{2} : 1$ and $\frac{3}{5} : 1\frac{1}{5}$ or $\frac{3}{5} : \frac{6}{5}$.

Product of extremes $= \frac{1}{2} \times \frac{6}{5} = \frac{6}{10} = \frac{3}{5}$

Product of means $= 1 \times \frac{3}{5} = \frac{3}{5}$

As $\frac{3}{5} = \frac{3}{5}$.

Hence in proportion.

(vii) 8 : 40 and 40 : 200.

Product of extremes $= 8 \times 200 = 1600$.

Product of means $= 40 \times 40 = 1600$.

As $1600 = 1600$.

Hence in proportion.

(viii) 588 : 84 and 84 : 12

Product of extremes $= 588 \times 12 = 7056$

Product of means $= 84 \times 84 = 7056$

As $7056 = 7056$

Hence in proportion

(ix) 10 : 20 and 20 : 30.

Product of extremes $= 10 \times 30 = 300$.

Product of means $= 20 \times 20 = 400$.

As $300 \neq 400$

They are not in proportion.

3(i) $3 : 27 :: 1 : x$.

Product of extremes and means are equal.

$3 \times x = 27 \times 1$

$x = \frac{27 \times 1}{3} = 9$ Ans

(ii) $5 : x :: 55 : 11$

Product of extremes and means are equal

$5 \times 11 = x \times 55$

$x = \frac{5 \times 11}{55} = 1.$

(iii) $x : 12 :: 21 : 7$

Product of extremes and means are equal.

$x \times 7 = 12 \times 21$

$x = \frac{12 \times 21}{7} = 36$

(iv) $13 : 52 :: x : 11$

Product of extremes and means are equal.

$13 \times 11 = x \times 52$

$x = \frac{13 \times 11}{52} = \frac{11}{4} = 2\frac{3}{4} = 2.75$ Ans

(v) $6 : 19.8 :: x : 16.5.$

Product of extremes is equal to product of means.

$x \times 19.8 = 6 \times 16.5$

$x = \frac{6 \times 16.5}{19.8} = 5$ Ans

3(vi) 9, 18, x equals 9:18::18:x.

Product of extremes and means are equal.

$9 \times x = 18 \times 18$.

$x = \frac{18 \times 18}{9} = 36$ Ans

(vii) x, 5, 25 equals x:5::5:25.

Product of extremes and means are equal.

$x \times 25 = 5 \times 5$

$x = \frac{5 \times 5}{25} = 1$ Ans

(viii) 8, 44, x equals 8:44::44:x

Product of extremes and means are equal.

$8 \times x = 44 \times 44$.

$x = \frac{44 \times 44}{8} = 242$ Ans

4 (i) 80, 2, 10, 16.

80:10::16:2

Check : $80 \times 2 = 16 \times 10$.

$160 = 160$

(ii) 11, 24, 22, 12

11:22::12:24.

Check $11 \times 24 = 22 \times 12$

$264 = 264$

(iii) 10,000 : 100 :: 1000 : 10 Ans

$10,000 \times 10 = 100 \times 1000$

$100,000 = 100,000$.

(iv) 30, 35, 7, 6

4(iv) 30 : 6 :: 35 : 7. Ans

Check

$30 \times 7 = 6 \times 35$

$210 = 210$.

4(v)

10, 1000, 100

10, 100, 100, 1000. , Proportion

10 : 100 :: 100 : 1000 Ans

Check.

$10 \times 1000 = 100 \times 100$

$10,000 = 10,000$.

4(vi) 6, 54, 18

6, 18, 18, 54.

Proportion

6 : 18 :: 18 : 54. Ans

Check

$6 \times 54 = 18 \times 18$

$324 = 324$.

- are

Exercise-9.3

1 (i) $3:12::1:4$.

As $3 \times 4 = 12 \times 1$

$12 = 12$

They are in direct proportion.

(ii) $17:1::85:5$.

$17 \times 5 = 85 \times 1$

$85 = 85$

As product of extremes & means are equal, hence in direct proportion

(iii) $10:5::2:4$

$10 \times 2 = 5 \times 4$

$20 = 20$

$\therefore$ It is inverse proportion.

(iv) $7:35::20:4$.

As $7 \times 20 = 35 \times 4$.

$140 = 140$.

$\therefore$ It is Inverse proportion

Ex - 9.3 Cl 9/18.

7(v) 18 : 6 :: 18 : 54.

As $18 \times 18 = 6 \times 54$.

$\therefore 324 = 324$

It is inverse proportion

(vi) 23 : 1 :: 115 : 5.

As product of extremes = Product of means

$23 \times 5 = 1 \times 115$.

$115 = 115$

They are in direct proportion.

2) As more men will make more earthen pots. It is direct proportion

$\therefore 35 : 245 :: 70 : x$

$35 \times x = 245 \times 70$

$x = \frac{245 \times 70}{35} = 490$ earthen Pots

Ans

3) As more men will take less time to make 245 earthen pots, it is inverse proportion.

Proportion is.

$35 : 70 =$ Inverse of $1 : x$.

$35 : 70 :: x : 1$

$35 \times 1 = 70 \times x$

$x = \frac{35}{70} = \frac{1}{2}$ day. Ans

Ex-9.3 Q9 to 19.

4) As more speed will take less time. It is inverse proportion.

Speed of Train = 110 km/h.

Time = 18h

Speed of helicopter = 180 km/h.

Time = x.

110 : 180 :: Inverse of 18 : x.

or 110 : 180 :: x : 18.

$\therefore 110 \times 18 = x \times 180.$

$x = \frac{110 \times 18}{180} = 11h$ Ans

5) As distance will increase with time. It is direct proportion.

Distance = 5km.

Time = $\frac{1}{2}$ hour.

2nd Distance = x km

2nd time = 2 hours.

∴ Proportion is

$\frac{1}{2}$: 2 hour :: 5 km : x km

$\frac{1}{2} \times x = 2 \times 5.$

$x = \frac{2 \times 5 \times 2}{1} = 20km$ Ans

Exercise - 9.5

	Speed	Distance	Time
(i)	80 km/h	240 km	3 h
(ii)	50 km/h	200 km	4 h
(iii)	25 km/h	150 km	6 h
(iv)	30 km/h	2500 m	5 min
(v)	108 km/h	12.6 m	7 min
(vi)	9 km/h	5 m	2 sec
(vii)	80 km/h	14.4 km	10 min 48 sec
(viii)	21.6 km/h	600 cm	1 sec
(ix)	10.8 km/h	450 cm	1.5 sec
(x)	194.4 km/h	162 m	3 sec

2) Distance = 1134 km

Speed = 180 km/h

Time = $\frac{\text{Distance}}{\text{speed}} = \frac{1134}{180} = 6.3$ h

= 6 h 18 min

Ex- 9.5. 6/9/24.

3) Distance = 5.6 km.

Speed = 56 km/h.

time = $\frac{\text{Distance}}{\text{speed}} = \frac{5.6}{56} = \frac{1}{10}$ h.

= 6 minutes Ans

Since it has to come back.

also.

Total time = 6 + 6 = 12 minutes

Or.

Distance = 5.6 x 2 [Since it has to come back]

Speed = 56 km/h.

time = $\frac{5.6 \times 2}{56}$.

= $\frac{1}{5}$ h.

= $\frac{60}{5}$ = 12 minutes Ans

4) Distance of one lap = 400 m.

Distance of 15 laps = 400 x 15 = 6000 m.

= 6 km.

time taken = 8 minutes.

Speed = $\frac{\text{Distance}}{\text{time}} = \frac{6}{8}$ km/min.

= $\frac{6}{8} \times 60$ km/h

= 45 km/h.

= 45 km/h.

5) Speed = 2.5 m/2 secs.

= 1.25 m/sec.

time = 3 minutes = 180 sec.

Distance = Speed x time

= 1.25 x 180 m = 225 m.

Ex- 9.5 6/9/25.

6) Length = 100 m.

Breadth = 75 m.

Perimeter of field = 2(100+75) = 350 m.

Laps = 5.

Total Distance = 350 × 5.

= 1750 m. = 1.75 km.

time = $\frac{1}{4}$ h.

speed = $\frac{\text{Distance}}{\text{time}} = \frac{1.75}{\frac{1}{4}} = 1.75 \times 4$.

= 7 km/h. Ans

7) Total distance will be length of train and length of platform.

= 100 + 150 = 250 m = 0.25 km

Speed = 90 km/h.

time = $\frac{\text{Distance}}{\text{Speed}} = \frac{0.25}{90}$ h.

= $\frac{0.25}{90} \times 60 \times 60$ m/sec.

= $\frac{15 \times 60}{90_6} = 10$ Sec Ans