

Exercise - 11A

Express each of the following ratios in its simplest form:-

$$\begin{aligned} \text{a) i) } 4:6 &= \frac{4}{2} \frac{2}{3} \\ &= \frac{2}{3} = 2:3 \\ \text{ii) } 48:54 &= \frac{48}{6} \frac{9}{9} \\ &= \frac{8}{9} \\ &= 8:9 \end{aligned}$$

$$\begin{aligned} \text{iii) } 200:250 &= \frac{200}{50} \frac{5}{5} \\ &= \frac{4}{5} = 4:5 \end{aligned}$$

$$\begin{aligned} \text{b) i) } 5 \text{ kg} : 800 \text{ gm} \quad & 5 \text{ kg} = 5 \times 1000 \\ & = 5000 \text{ g} \end{aligned}$$

$$\begin{aligned} \text{Required ratio} &= \frac{5000}{800} \frac{25}{4} \\ &= \frac{25}{4} = 25:4 \end{aligned}$$

$$\begin{aligned} \text{ii) } 30 \text{ cm} : 2 \text{ m} \quad & 2 \text{ m} = 2 \times 100 \\ & = 200 \end{aligned}$$

$$\begin{aligned} \text{Required ratio} &= \frac{300\text{cm}}{200\text{cm}} \\ &= \frac{3}{20} = 3:20 \end{aligned}$$

$$\text{ii) } 3\text{m} : 90\text{cm} \qquad 3\text{m} = 3 \times 100 = 300\text{cm}$$

$$\begin{aligned} \text{Required ratio} &= \frac{300\text{cm}}{90\text{cm}} \times \frac{10}{3} \\ &= \frac{10}{3} = 10:3 \end{aligned}$$

$$\text{iv) } 2\text{ years} : 9\text{ months} \qquad 2\text{ years} = 2 \times 12 = 24\text{ months}$$

$$\begin{aligned} \text{Required ratio} &= \frac{24\text{ months}}{9\text{ months}} \times \frac{8}{3} \\ &= \frac{8}{3} = 8:3 \end{aligned}$$

$$\text{v) } 1\text{ hour} : 45\text{ min} \qquad 1\text{ hour} = 60\text{ mins}$$

$$\begin{aligned} \text{Required ratio} &= \frac{60\text{ mins}}{45\text{ mins}} \times \frac{4}{3} \\ &= \frac{4}{3} = 4:3 \end{aligned}$$

$$\text{vi) } 4\text{ min} : 45\text{ sec} \qquad 4\text{ min} = 4 \times 60 = 240\text{ secs}$$

$$\begin{aligned} \text{Required ratio} &= \frac{240\text{ secs}}{45\text{ secs}} \times \frac{48}{3} \times \frac{16}{3} = \frac{16}{3} \\ &= 16:3 \end{aligned}$$

$$\text{iv) } 1\frac{1}{2} : 2\frac{1}{2} = \frac{3}{2} : \frac{5}{2} = \frac{3}{2} \div \frac{5}{2} = \frac{3}{2} \times \frac{2}{5} = \frac{3}{5} = 3:5$$

$$\text{v) } 3\frac{1}{2} : 7 = \frac{7}{2} : 7 = \frac{7}{2} \div 7 = \frac{7}{2} \times \frac{1}{7} = \frac{1}{2} = 1:2$$

~~vi) $2\frac{1}{3} : 3\frac{1}{2} = \frac{5}{3} : \frac{7}{2} = \frac{5}{3} \div \frac{7}{2} = \frac{5}{3} \times \frac{2}{7} = \frac{10}{21}$~~

$$\text{vii) } x^2 : 4x = \frac{x \times x}{4 \times x} = \frac{x}{4} = x:4$$

$$\text{viii) } 2.5 : 1.5 = \frac{2.5}{1.5} = \frac{25}{15} = \frac{25}{15} \div \frac{5}{5} = \frac{5}{3} = 5:3$$

$$\text{ix) } 2.5 : 5 = \frac{2.5}{5} = \frac{25}{10} \div \frac{5}{5} = \frac{5}{2} = 5:2$$

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iii) $2\frac{1}{3} : 3\frac{1}{2} : 1\frac{1}{4}$

$\begin{array}{l} 2 \overline{) 3, 2, 4} \\ 3, 1, 2 \end{array}$

$= \frac{7}{3} : \frac{7}{2} : \frac{5}{4}$

LCM of 3, 2, 4 = 12

$= \frac{7 \times 12^4}{3} : \frac{7 \times 12^8}{2} : \frac{5 \times 12^3}{4}$

$= 28 : 42 : 15$

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Exercise-11A

2) A field is 80m long and 60m wide. Find the ratio of its ~~length~~^{width} to its length.

Ans Field width = 60m
Field length = 80m

$$\begin{aligned} \text{Ratio} &= 60\text{m} : 80\text{m} \\ &= \frac{60\text{m}}{80\text{m}} \times \frac{3}{4} \\ &= 3:4 \end{aligned}$$

∴ Hence, the ratio is 3:4.

3) State true or false.

1) A ratio equivalent to 7:9 is 27:21. False

ii) A ratio equivalent to 5:4 is 240 & 192.
True

iii) A ratio of 250gm and 3kg is 1:12. True

4) Is the ratio of 15kg and 35kg same as the ratio of 6 years and 14 years?

Ans Ratio of 15kg and 35kg = $\frac{15\text{kg}}{35\text{kg}} = \frac{3}{7} = 3:7$

Ratio of 6 years and 14 years = $\frac{6\text{ years}}{14\text{ years}} = \frac{3}{7} = 3:7$

$\therefore 3:7 = 3:7$

\therefore Hence, ratio of 15kg and 35kg is same as 6 years and 14 years.

5) Is the ratio of 6g and 15g same as the ratio of 36cm and 90cm?

Ans Ratio of 6g and 15g = $\frac{6\text{g}}{15\text{g}} = \frac{2}{5} = 2:5$

$$\text{Ratio of } 36\text{cm and } 90\text{cm} = \frac{36\text{cm}}{90\text{cm}} = \frac{2}{5} = 2:5$$

$$\therefore 2:5 = 2:5$$

\therefore Hence, Ratio of 36g and 15g is same as the 36cm and 90cm. - o -

6) Find the ratio between 3.5m, 475cm and 28m.

Ans $3.5\text{m} : 475\text{cm} : 2.8\text{m}$

$$\Rightarrow \frac{3.5 \times 100}{10} : 475\text{cm} : \frac{2.8 \times 100}{10}$$

$$= 350\text{cm} : 475\text{cm} : 280\text{cm}$$

$$\text{HCF of } 350\text{cm}, 475\text{cm}, 280\text{cm} = 70 : 95 : 96$$

$$\frac{5 \mid 350\text{cm}, 475\text{cm}, 280\text{cm}}{70, 95, 96}$$

\therefore Hence, the ratio between 350cm, 475cm, 280cm is $70:95:96$.

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7) Find the ratio between 5 dozens and 2 scores.
[1 score = 20]

Ans 1 dozen = 12
5 dozens = 12×5
= 60

1 score = 20
2 scores = 20×2
= 40

Req. ratio = 5 dozens : 2 scores
= 60 : 40
= $\frac{60}{40} : \frac{3}{2}$
= 3 : 2

∴ Hence, the ratio between 5 dozens and 2 scores is 3 : 2.