Exercise 11 (A)

1. Express each of the following ratios in its simplest form:

a) i) 4 : 6

Sol- $\frac{4^2}{6_3} = \frac{2}{3} = 2:3$

ii) 48 : 54

Sol- $\frac{48^8}{54_9} = \frac{8}{9} = 8:9$

iii) 200 : 250

Sol- $\frac{200^4}{250_5} = \frac{4}{5} = 4:5$

b) i) 5kg : 800 gm

Sol- 5kg = 5 × 1000 gm = 5000 gm

Ratio = $\frac{5000^{25}}{800_4} = \frac{25}{4} = 25:4$

ii) 30 cm : 2m

Sol- 1m = 100 cm

2m = 200 cm

30cm : 200 cm

$= \frac{30}{200} = \frac{3}{20} = 3:20$

iii) 3m : 90 cm

Sol- 300 cm : 90

$\frac{300^{10}}{90_3} = \frac{10}{3} = 10:3$

iv) 2 years : 9 months

Sol- 2 year = 2 × 12

= 24 months

24 months : 9 months

$= \frac{24^{8}}{9_{3}} = \frac{8}{3}$

= 8 : 3

v) 1 hour : 45 min

Sol- 1 hour = 60 min

= 60 min : 45 min

$= \frac{60\ \text{min}}{45\ \text{min}} = \frac{60^{12^{4}}}{45_{3}} = \frac{4}{3}$

= 4 : 3

vi) 4 min : 45 sec

Sol- 1 min = 60 sec

4 min = 4 × 60 sec

= 240 sec

= 240 Sec : 45 sec

$= \frac{240\ \text{sec}}{45\ \text{sec}} = \frac{240^{16}}{45_{3}}$

$= \frac{16}{3} = 16 : 3$

c.i) $1\frac{1}{2} : 2\frac{1}{2}$

Sol- $1\frac{1}{2} = \frac{3}{2}$, $2\frac{1}{2} = \frac{5}{2}$

$= \frac{3}{2} : \frac{5}{2} = \frac{3}{2} \div \frac{5}{2}$

$= \frac{3}{2} \times \frac{2}{5} = \frac{3}{5}$

= 3 : 5

ii) $3\frac{1}{2} : 7$

Sol- $3\frac{1}{2} = \frac{7}{2}$

$= \frac{7}{2} : 7 = \frac{7}{2} \div \frac{7}{1}$

$= \frac{7}{2} \times \frac{1}{7} = \frac{1}{2}$

$= 1 : 2$

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

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

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

= Lcm of 3, 2 and 4 = 12

$= \frac{7}{3} \times 12^4 : \frac{7}{2} \times 12^6 : \frac{5}{4} \times 12^3$

$= 28 : 42 : 15$

iv) $x^2 : 4x$

Sol- $\frac{x^2}{4x} = \frac{x \times x}{4 \times x}$

$= \frac{x}{4} = x : 4$

v) $2.5 : 1.5$

Sol- $\frac{25}{15} = \frac{5}{3} = 5 : 3$ OR

$= \frac{25}{10} : \frac{15}{10} = \frac{25}{10} \div \frac{15}{10}$

$= \frac{25}{10} \times \frac{15}{15} = \frac{25^5}{15_3}$

$= \frac{5}{3} = 5 : 3$

vi) $2.5 : 5$

Sol- $2.5 = \frac{25}{10}$

$= \frac{25}{10} : \frac{5}{1} = \frac{25}{10} \div \frac{5}{1}$

$= \frac{25^5}{10} \times \frac{1}{5} = \frac{8^1}{10_2}$

$= \frac{1}{2} = 1 : 2$

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03.09.21

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2. A field is 80m long and 60m wide. Find the ratio of its width to its length.

Sol- Width of field = 60m
Length of field = 80m
Ratio between width and length = $\frac{60^{3}}{80_{4}} = \frac{3}{4}$

Ratio = 3:4
∴ The required ratio is 3:4

3. State, True or False:

i) A ratio equivalent to 7:9 is 27:21

Sol- 7:9 is already in reduced form.
$27:21 = \frac{27^{9}}{21_{7}} = 9:7$

∴ The given Statement is False.

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

Sol- 5:4 is already in simplest form.
$240:192 = \frac{240^{5}}{192_{4}} = \frac{5}{4} = 5:4$

∴ The given Statement is True.

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

Sol- 3kg = 3×1000gm = 3000gm
= 250 gm : 3000 gm = $\frac{250}{3000_{12}} = \frac{1}{12} = 1:2$

∴ The given Statement is True.

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

Sol- Ratio of weight 15 kg and 3kg = $\frac{15^{3}}{35_{7}} = \frac{3}{7} = 3:7$

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

Yes, the ratio are same in both the cases.

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

Sol- Ratio of 6g and 15g $= \frac{6^2}{15^5} = \frac{2}{5} = 2:5$

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

Yes, the ratio in both cases are same.

6. Find the ratio between 3.5m, 475cm and 2.8m.

Sol- Given values = 3.5m, 475cm and 2.8m

3.5m = 3.5 × 100cm = 350 cm and 2.8m = 2.8 × 100 cm = 280 cm

= 350 cm : 475 cm : 280 cm

= 70 cm : 95 cm : 56 cm

∴ The ratio is 70 : 95 : 56

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

Sol- 1 dozen = 12

5 dozen = 12 × 5 = 60

1 score = 20

2 score = 20 × 2 = 40

Required ratio = 60 : 40 $= \frac{60^3}{40_2}$

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∴ The ratio is 3 : 2