

Mathematics

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(Chapter - 12) (Ratio and Proportion)
(Class - VI)

Exercise 12.2

Question 1:

Determine the following are in proportion:

- (a) 15, 45, 40, 120
- (b) 33, 121, 9, 96
- (c) 24, 28, 36, 48
- (d) 32, 48, 70, 210
- (e) 4, 6, 8, 12
- (f) 33, 44, 75, 100

Answer 1:

$$(a) 15 : 45 = \frac{\cancel{15}}{\cancel{45}} = \frac{1}{3} = 1 : 3$$

$$40 : 120 = \frac{\cancel{40}}{\cancel{120}} = \frac{1}{3} = 1 : 3$$

Since $15 : 45 = 40 : 120$

Therefore, 15, 45, 40, 120 are in proportion.

$$(b) 33 : 121 = \frac{\cancel{33}}{\cancel{121}} = \frac{3}{11} = 3 : 11$$

$$9 : 96 = \frac{\cancel{9}}{\cancel{96}} = \frac{3}{32} = 3 : 32$$

Since $33 : 121 \neq 9 : 96$

Therefore, 33, 121, 9, 96 are not in proportion.

$$(c) 24 : 28 = \frac{\cancel{24}}{\cancel{28}} = \frac{6}{7} = 6 : 7$$

$$36 : 48 = \frac{\cancel{36}}{\cancel{48}} = \frac{3}{4} = 3 : 4$$

Since $24 : 28 \neq 36 : 48$

Therefore, 24, 28, 36, 48 are not in proportion.

$$(d) 32 : 48 = \frac{\cancel{32}}{\cancel{48}} = \frac{2}{3} = 2 : 3$$

$$70 : 210 = \frac{\cancel{70}}{\cancel{210}} = \frac{1}{3} = 1 : 3$$

Since $32 : 48 \neq 70 : 210$

Therefore, 32, 48, 70, 210 are not in proportion.

$$(e) 4 : 6 = \frac{\cancel{4}}{\cancel{6}} = \frac{2}{3} = 2 : 3$$

$$8 : 12 = \frac{\cancel{8}}{\cancel{12}} = \frac{2}{3} = 2 : 3$$

Since $4 : 6 = 8 : 12$

Therefore, 4, 6, 8, 12 are in proportion.

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$$(f) 33 : 44 = \frac{\cancel{33}}{\cancel{44}} = \frac{3}{4} = 3 : 4$$

$$75 : 100 = \frac{\cancel{75}}{\cancel{100}} = \frac{3}{4} = 3 : 4$$

Since $33 : 44 = 75 : 100$

Therefore, 33, 44, 75, 100 are in ratio.

Question 2:

Write True (T) or False (F) against each of the following statements:

- (a) $16 : 24 :: 20 : 30$
- (b) $21 : 6 :: 35 : 10$
- (c) $12 : 18 :: 28 : 12$
- (d) $8 : 9 :: 24 : 27$
- (e) $5.2 : 3.9 :: 3 : 4$
- (f) $0.9 : 0.36 :: 10 : 4$

Answer 2:

- (a) $16 : 25 :: 20 : 30$

$$\Rightarrow \frac{\cancel{16}}{\cancel{24}} = \frac{\cancel{20}}{\cancel{30}}$$

$$\Rightarrow \frac{2}{3} = \frac{2}{3}$$

Hence, it is True.

- (b) $21 : 6 :: 35 : 10$

$$\Rightarrow \frac{\cancel{21}}{\cancel{6}} = \frac{\cancel{35}}{\cancel{10}}$$

$$\Rightarrow \frac{7}{2} = \frac{7}{2}$$

Hence, it is True.

- (c) $12 : 18 :: 28 : 12$

$$\Rightarrow \frac{\cancel{12}}{\cancel{18}} = \frac{\cancel{28}}{\cancel{12}}$$

$$\Rightarrow \frac{2}{3} \neq \frac{7}{3}$$

Hence, it is False.

- (d) $8 : 9 :: 24 : 27$

$$\Rightarrow \frac{\cancel{8}}{\cancel{9}} = \frac{\cancel{24}}{\cancel{27}}$$

$$\Rightarrow \frac{8}{9} = \frac{8}{9}$$

Hence, it is True.



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(e) $5.2 : 3.9 :: 3 : 4$

$$\Rightarrow \frac{\cancel{5.2}}{\cancel{3.9}} = \frac{\cancel{3}}{\cancel{4}}$$

$$\Rightarrow \frac{4}{3} \neq \frac{3}{4}$$

Hence, it is False.

(f) $0.9 : 0.36 :: 10 : 4$

$$\Rightarrow \frac{\cancel{0.9}}{\cancel{0.36}} = \frac{\cancel{10}}{\cancel{4}}$$

$$\Rightarrow \frac{5}{2} = \frac{5}{2}$$

Hence, it is True.

Question 3:

Are the following statements true:

(a) 40 persons : 200 persons = ₹15 : ₹75

(b) 7.5 litres : 15 litres = 5 kg : 10 kg

(c) 99 kg : 45 kg = ₹44 : ₹20

(d) 32 m : 64 m = 6 sec. : 12 sec.

(e) 45 km : 60 km = 12 hours : 15 hours

Answer 3:

(a) 40 persons : 200 persons = $\frac{\cancel{40}}{\cancel{200}} = \frac{1}{5} = 1 : 5$

$$₹15 : ₹75 = \frac{\cancel{15}}{\cancel{75}} = \frac{1}{5} = 1 : 5$$

Since, 40 persons : 200 persons = ₹15 : ₹75

Hence, the statement is true.

(b) 7.5 litres : 15 litres = $\frac{7.5}{15} = \frac{\cancel{75}}{\cancel{150}} = \frac{1}{2} = 1 : 2$

$$5 \text{ kg} : 10 \text{ kg} = \frac{\cancel{5}}{\cancel{10}} = \frac{1}{2} = 1 : 2$$

Since, 7.5 litres : 15 litres = 5 kg : 10 kg

Hence, the statement is true.

(c) 99 kg : 45 kg = $\frac{\cancel{99}}{\cancel{45}} = \frac{11}{5} = 11 : 5$

$$₹44 : ₹20 = \frac{\cancel{44}}{\cancel{20}} = \frac{11}{5} = 11 : 5$$

Since, 99 kg : 45 kg = ₹44 : ₹20

Hence, the statement is true.

(d) 32 m : 64 m = $\frac{\cancel{32}}{\cancel{64}} = \frac{1}{2} = 1 : 2$

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$$6 \text{ sec} : 12 \text{ sec} = \frac{\cancel{6}}{\cancel{12}} = \frac{1}{2} = 1 : 2$$

Since, $32 \text{ m} : 64 \text{ m} = 6 \text{ sec} : 12 \text{ sec}$

Hence, the statement is true.

$$(e) 45 \text{ km} : 60 \text{ km} = \frac{\cancel{45}}{\cancel{60}} = \frac{3}{4} = 3 : 4$$

$$12 \text{ hours} : 15 \text{ hours} = \frac{\cancel{12}}{\cancel{15}} = \frac{4}{5} = 4 : 5$$

Since, $45 \text{ km} : 60 \text{ km} \neq 12 \text{ hours} : 15 \text{ hours}$

Hence, the statement is not true.

Question 4:

Determine if the following ratios form a proportion. Also, write the middle terms and extreme terms where the ratios form a proportion:

(a) 25 cm : 1 m and ₹40 : ₹160

(b) 39 litres : 65 litres and 6 bottles : 10 bottles

(c) 2 kg : 80 kg and 25 g : 625 g

(d) 200 ml : 2.5 ml and ₹4 : ₹50

Answer 4:

$$(a) 25 \text{ cm} : 1 \text{ m} = 25 \text{ cm} : (1 \times 100) \text{ cm} = 25 \text{ cm} : 100 \text{ cm} = \frac{\cancel{25}}{\cancel{100}} = \frac{1}{4} = 1 : 4$$

$$₹40 : ₹160 = \frac{\cancel{40}}{\cancel{160}} = \frac{1}{4} = 1 : 4$$

Since the ratios are equal, therefore these are in proportion.

Middle terms = 1 m, ₹40 and Extreme terms = 25 cm, ₹160

$$(b) 39 \text{ litres} : 65 \text{ litres} = \frac{\cancel{39}}{\cancel{65}} = \frac{3}{5}$$

$$6 \text{ bottles} : 10 \text{ bottles} = \frac{\cancel{6}}{\cancel{10}} = \frac{3}{5} = 3 : 5$$

Since the ratios are equal, therefore these are in proportion.

Middle terms = 65 litres, 6 bottles and Extreme terms = 39 litres, 10 bottles

$$(c) 2 \text{ kg} : 80 \text{ kg} = \frac{\cancel{2}}{\cancel{80}} = \frac{1}{40} = 1 : 40$$

$$25 \text{ g} : 625 \text{ g} = \frac{\cancel{25}}{\cancel{625}} = \frac{1}{25} = 1 : 25$$

Since the ratios are not equal, therefore these are not in proportion.

$$(d) 200 \text{ ml} : 2.5 \text{ litres} = 200 \text{ ml} : (25000) \text{ ml} = 200 \text{ ml} : 2500 \text{ ml} = \frac{\cancel{200}}{\cancel{2500}} = \frac{2}{25} = 2 : 25$$

$$₹4 : ₹50 = \frac{\cancel{4}}{\cancel{50}} = \frac{2}{25} = 2 : 25$$

Since the ratios are equal, therefore these are in proportion.

Middle terms = 2.5 litres, ₹4 and Extreme terms = 200 ml, ₹50

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