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1. Determine if 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

Solutions:

(a) 15, 45, 40, 120

15 / 45 = 1 / 3

40 / 120 = 1 / 3

Hence, 15:45 = 40:120

∴ They are in proportion.

(b) 33, 121, 9, 96

33 / 121 = 3 / 11

9 / 96 = 3 / 32

Hence 33:121 ≠ 9: 96

∴ They are not in proportion.

(c) 24, 28, 36, 48

24 / 28 = 6 / 7

36 / 48 = 3 / 4

Hence, 24:28 ≠ 36:48

∴ They are not in proportion.

(d) 32, 48, 70, 210

32 / 48 = 2 / 3

70 / 210 = 1 / 3

Hence, 32:48 ≠ 70:210

∴ They are not in proportion.

(e) 4, 6, 8, 12

4 / 6 = 2 / 3

8 / 12 = 2 / 3

Hence 4: 6 = 8: 12

∴ These are in a proportion

(f) 33, 44, 75, 100

33/ 44 = 3/ 4

75 / 100 = 3 / 4

Hence, 33:44 = 75:100

∴ These are in proportion.

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

Solutions:

(a) 16:24 :: 20:30

16 / 24 = 2 / 3

20 / 30 = 2 / 3

Hence, 16:24 = 20:30

Therefore, True.

(b) 21:6 :: 35:10

21 / 6 = 7 / 2

35 / 10 = 7 / 2

Hence, 21:6 = 35:10

Therefore, True.

(c) 12:18 :: 28:12

12 / 18 = 2 / 3

28 / 12 = 7 / 3

Hence, 12:18 ≠ 28:12

Therefore, False,

(d) 8:9:: 24:27

We know that = 24 / 27 = (3 × 8) / (3 × 9)

= 8 / 9

Hence, 8:9 = 24:27

Therefore, True.

(e) 5.2:3.9 :: 3: 4

As 5.2 / 3.9 = 4 / 3

Hence, 5.2: 3.9 ≠ 3: 4

Therefore, False,

(f) 0.9:0.36 :: 10:4

0.9 / 0.36 = 90 / 36

= 10 / 4

Hence, 0.9: 0.36 = 10: 4

Therefore, True,

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

Solutions:

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

40 / 200 = 1 / 5

15 / 75 = 1 / 5

Hence, True.

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

7.5 / 15 = 1 / 2

5 / 10 = 1 / 2

Hence, True.

(c) 99 kg : 45 kg = ₹ 44 : ₹ 20

99 / 45 = 11 / 5

44 / 20 = 11 / 5

Hence, True.

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

32 / 64 = 1 / 2

6 / 12 = 1 / 2

Hence, True.

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

45 / 60 = 3 / 4

12 / 15 = 4 / 5

Hence, False.

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 litre and ₹ 4 : ₹ 50

Solutions:

(a) 25 cm : 1 m and ₹ 40 : ₹ 160

25 cm = 25 / 100 m

= 0.25 m

0.25 / 1 = 1 / 4

40 / 160 = 1 / 4

Yes, these are in proportion.

Middle terms are 1 m, ₹ 40, and extreme terms are 25 cm, ₹ 160.

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

39 / 65 = 3 /5

6 / 10 = 3 / 5

Yes, these are in proportion.

Middle terms are 65 litres, 6 bottles, and extreme terms are 39 litres, 10 bottles.

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

2 / 80 = 1 / 40

25 / 625 = 1 / 25

No, these are not in proportion.

(d) 200 mL : 2.5 litre and ₹ 4 : ₹ 50

1 litre = 1000 ml

2.5 litre = 2500 ml

200 / 2500 = 2 / 25

4 / 50 = 2 / 25

Yes, these are in proportion.

Middle terms are 2.5 litres, ₹ 4 and extreme terms are 200 ml, ₹ 50.