

## EXERCISE 12.2

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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

$$15 / 45 = 1 / 3$$

$$40 / 120 = 1 / 3$$

$$\text{Hence, } 15: 45 = 40:120$$

 $\therefore$  These are in a proportion**(b)** 33, 121, 9, 96

$$33 / 121 = 3 / 11$$

$$9 / 96 = 3 / 32$$

$$\text{Hence } 33:121 \neq 9: 96$$

 $\therefore$  These are not in a proportion**(c)** 24, 28, 36, 48

$$24 / 28 = 6 / 7$$

$$36 / 48 = 3 / 4$$

$$\text{Hence, } 24: 28 \neq 36:48$$

 $\therefore$  These are not in a proportion**(d)** 32, 48, 70, 210

$$32 / 48 = 2 / 3$$

$$70 / 210 = 1 / 3$$

$$\text{Hence, } 32: 48 \neq 70: 210$$

 $\therefore$  These are not in a proportion**(e)** 4, 6, 8, 12

$$4 / 6 = 2 / 3$$

$$8 / 12 = 2 / 3$$

$$\text{Hence } 4: 6 = 8: 12$$

 $\therefore$  These are in a proportion**(f)** 33, 44, 75, 100

$$33 / 44 = 3 / 4$$

$$75 / 100 = 3 / 4$$

$$\text{Hence, } 33:44 = 75: 100$$

 $\therefore$  These are in a 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,  $12 : 18 \neq 28 : 12$ 

Therefore False

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

$$\text{We know that } = 24 / 27 = (3 \times 8) / (3 \times 9) \\ = 8 / 9$$

Hence,  $8 : 9 = 24 : 27$ 

Therefore True

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

$$\text{As } 5.2 / 3.0 = 4 / 3$$

Hence,  $5.2 : 3.9 \neq 3 : 4$ 

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)  $40 \text{ persons} : 200 \text{ persons} = ₹ 15 : ₹ 75$

(b)  $7.5 \text{ litres} : 15 \text{ litres} = 5 \text{ kg} : 10 \text{ kg}$

(c)  $99 \text{ kg} : 45 \text{ kg} = ₹ 44 : ₹ 20$

(d)  $32 \text{ m} : 64 \text{ m} = 6 \text{ sec} : 12 \text{ sec}$

(e)  $45 \text{ km} : 60 \text{ km} = 12 \text{ hours} : 15 \text{ hours}$

**Solutions:**

(a)  $40 \text{ persons} : 200 \text{ persons} = ₹ 15 : ₹ 75$

$$40 / 200 = 1 / 5$$

$$15 / 75 = 1 / 5$$

Hence, True

(b)  $7.5 \text{ litres} : 15 \text{ litres} = 5 \text{ kg} : 10 \text{ kg}$

$$7.5 / 15 = 1 / 2$$

$$5 / 10 = 1 / 2$$

Hence, True

(c)  $99 \text{ kg} : 45 \text{ kg} = ₹ 44 : ₹ 20$

$$99 / 45 = 11 / 5$$

$$44 / 20 = 11 / 5$$

Hence, True

(d)  $32 \text{ m} : 64 \text{ m} = 6 \text{ sec} : 12 \text{ sec}$

$$32 / 64 = 1 / 2$$

$$6 / 12 = 1 / 2$$

Hence, True

(e)  $45 \text{ km} : 60 \text{ km} = 12 \text{ hours} : 15 \text{ hours}$

$$45 / 60 = 3 / 4$$

$$12 / 15 = 4 / 5$$

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)  $25 \text{ cm} : 1 \text{ m}$  and  $₹ 40 : ₹ 160$

(b)  $39 \text{ litres} : 65 \text{ litres}$  and  $6 \text{ bottles} : 10 \text{ bottles}$

(c)  $2 \text{ kg} : 80 \text{ kg}$  and  $25 \text{ g} : 625 \text{ g}$

(d)  $200 \text{ mL} : 2.5 \text{ litre}$  and  $₹ 4 : ₹ 50$

**Solutions:**

(a)  $25 \text{ cm} : 1 \text{ m}$  and  $₹ 40 : ₹ 160$

$$25 \text{ cm} = 25 / 100 \text{ m}$$

$$= 0.25 \text{ m}$$

$$0.25 / 1 = 1 / 4$$

$$40 / 160 = 1 / 4$$

Yes, these are in a proportion

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

(b)  $39 \text{ litres} : 65 \text{ litres}$  and  $6 \text{ bottles} : 10 \text{ bottles}$

$$39 / 65 = 3 / 5$$

$$6 / 10 = 3 / 5$$

Yes, these are in a proportion

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

(c)  $2 \text{ kg} : 80 \text{ kg}$  and  $25 \text{ g} : 625 \text{ g}$

$$2 / 80 = 1 / 40$$

$$25 / 625 = 1 / 25$$

No, these are not in a proportion

(d)  $200 \text{ mL} : 2.5 \text{ litre}$  and  $₹ 4 : ₹ 50$

$$1 \text{ litre} = 1000 \text{ ml}$$

$$2.5 \text{ litre} = 2500 \text{ ml}$$

$$200 / 2500 = 2 / 5$$

$$4 / 50 = 2 / 25$$

Yes, these are in a proportion

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

