

DIRECT VARIATION: Two quantities a and b are said to vary directly, if the ratio $\frac{a}{b}$ remains constant.

EXAMPLES:

(i) The cost of articles varies directly as the number of articles. (More articles, more cost), (Less articles, less cost)

(ii) The work done varies directly as the number of men at work. (More men at work, more work), (Less men at work, less work)

Unitary Methods using variation Test Paper -1

These questions are based on direct variation So, $x_1 : y_1 = x_2 : y_2$ (Ratio of quantities = constant)

1. If 15 oranges cost Rs 110, what do 39 oranges cost?

$$15 : 110 = 39 : x \Rightarrow x = \frac{110 \times 39}{15} = 286$$

2. If 8 kg sugar costs Rs 260 how much sugar can be bought for Rs822.50?

$$8 : 260 = x : 822.50 \Rightarrow$$

3. The cost of 37 m of silk is Rs 6290. What length of this silk can be purchased for Rs 4420?

$$37 : 6290 = x : 4420$$

4. A worker is paid Rs 1110 for 6 days. If his total wages during a month are Rs 4625, for how many days did he work?

$$1110 : 6 = 4625 : x$$

5. A car can cover a distance of 357 km on 42 litres of petrol. How far can it travel on 12 litres of petrol?

$$375 : 42 = x : 12$$

6. Travelling 900 km by rail costs Rs 2520. What would be the fare for a journey of 360 km when a person travels by the same class?

$$900 : 2520 = 360 : x$$

7. A train covers a distance of 51 km in 45 minutes. How long will it take to cover 221km?

$$51 : 45 = 221 : x$$

8. If 22.5 meters of a uniform iron rod weighs 85.5 kg, what will be the length of 22.8 kg of the same rod?

$$22.5 : 85.5 = x : 22.8$$

9. If the weight of 6 sheets of a paper is 162 grams, how many sheets of the same quality of paper would weigh 13.5 kg?

$$6 : 0.162 = x : 13.5$$

10. 1152 bars of soap can be packed in 8 cartons of the same size. How many such cartons will be required to pack 3888 bars?

$$1152 : 8 = 3888 : x$$

11. If the thickness of a pile of 16 cardboards is 44 mm, how many cardboards will be there in a pile which is 71.5 cm thick?

$$16 : 4.4 = x : 71.5$$

12. At a particular time of day, a 7m high flagstaff casts a shadow which is 8.2m long. What is the height of the building which casts a shadow 20.5 meters in length at the same moment?

$$7 : 8.2 : x : 20.5$$

13. 15 men can build a 16.25 m long wall up to a certain height in one day. How many men should be employed to build a wall of the same height but of length 26 m in one day?

$$15 : 16.5 = x : 26$$

14. In a hospital, the monthly consumption of milk of 60 patients is 135 liters. How many patients can be accommodated in the hospital if the monthly ration of milk is raised to 1710 liters, assuming that the quota per head remains the same?

$$60 : 135 = x : 1710 \Rightarrow x = \frac{60 \times 1710}{135} = 76 \text{ days}$$

15. The extension in an elastic string varies directly as the weight hung on it. If a weight of 150 g produces an extension of 2.8 cm, what weight would produce an extension of 19.6 cm?

$$0.150 : 2.8 = x : 19.6 \Rightarrow x = \frac{0.150 \times 19.6}{2.8} = 1 \text{ kg } 50\text{g}$$

16. If 13 metres of a uniform iron rod weighs 23.4 kg then what will be the weight of 6 metres of the same rod?

$$13 : 23.4 = 6 : x$$

17. The length of the shadow of a 3-m-high pole at a certain time of the day is 3.6 m. What is the height of another pole whose shadow at that time is 54 m long?

$$3 : 3.6 = x : 54$$

18. If the cost of 9 toys is Rs 333, find the cost of 16 such toys. $9 : 333 = 16 : x$

19. If 25 metres of cloth costs Rs 1575, how many metres of it can be bought for Rs 2016?

$$25 : 1575 = x : 2016$$