

22-3-22

Course overview chart

Day -1 - Introduction and exercise 16-1 & 2 sum

Day -2 - Ex -16-3 to 6 sums

Day -3 - Rev Ch-16

Flow chart
Mathematics

↓

Arithmetic

↓

Comparing Quantities

Direct variations

↓ $x \uparrow$ & ↓ $y \uparrow$

$$K = \frac{x}{y}$$

$$a : b^2 :: c : d^2$$

$$a : b = \frac{a}{b}$$

Consequent Subsequent

Inverse variation

$$x \propto \frac{1}{y} \quad K = x \times y$$

Ex-16

1. Find the ratio of:

a. ₹ 10 to 50 p
 $= \frac{10}{100} : \frac{50}{100} = 20 : 1$

b. 10 km to 8100 m
 $10 \text{ km} = 10 \times 1000 = 10000 \text{ m}$
 $10000 : 8100 = 100 : 81$

c. 10 days : 30 hours
 $1 \text{ day} = 24 \text{ hours}$
 $10 \text{ days} = 240 \text{ hours}$

$$240 : 30 = \frac{240}{30} = 8$$

$$= 8 : 1$$

2

House pipe diameter (d_1) = 2 cm

Water volume carried per minute (V_1) = 40 l

Other house pipe (d_2) = 1.5 cm

Volume of it (V_2) =

If the amount of water $V \propto d^2$

$$d_1^2 : V_1 :: d_2^2 : V_2$$

$$2^2 : 40 :: 1.5^2 : V_2$$

$$4V_2 = 2.25 \times 40$$

$$V_2 = \frac{2.25 \times 40}{4}$$

$$\therefore V_2 = 22.5 \text{ l}$$

1

H.W. sum

a 10 l to 300 ml

$$= 10000 : 300$$

$$= 100 : 3$$

b ₹ 100 : 15 p

$$= 10000 : 15$$

$$= 2000 : 3$$

Ex-16

Day - 2

24-3-21

3 $D_1 = 7200 \text{ km}$

$T_1 = 4 \text{ hrs}$

$D_2 = ?$

$T_2 = 1\frac{1}{2} \text{ hrs} = \frac{3}{2} \text{ hrs}$

$$D_1 : T_1 :: D_2 : T_2$$
$$7200 : 4 :: D_2 : \frac{3}{2}$$

$$4D_2 = 7200 \times \frac{3}{2}$$
$$D_2 = \frac{7200 \times 3}{2 \times 4} = 2700$$

$D_2 = 2700 \text{ km}$

4 $T_1 = 2 \text{ sec}$

$d_1 = 20 \text{ m}$

$T_2 = \frac{1}{2} \text{ sec}$

$d_2 = ?$

$$d_2 = \frac{20}{10} = 1.25 \text{ m}$$

$\therefore d_2 = 1.25 \text{ m}$

Condition $T \propto \sqrt{d}$

$$T : \sqrt{d} :: T_2 : \sqrt{d_2}$$

~~2 sec~~

$$2\sqrt{d_2} = \sqrt{20} \times \frac{1}{2}$$

$$\sqrt{d_2} = \sqrt{20} \times \frac{1}{2 \times 2}$$

$$d_2 = \left(\sqrt{20} \times \frac{1}{4} \right)^2$$

$$d_2 = \sqrt{20} \times \sqrt{20} \times \frac{1}{16}$$

$$5 \quad V_1 = 500 \text{ l}$$

$$T_1 = 3 \text{ hr } 30 \text{ m}$$

$$T_1 = 3\frac{1}{2} = \frac{7}{2}$$

$$T_2 = ?$$

$$V_2 = \frac{1}{5} \times 500 = 100 \text{ l}$$

$$V_1 : T_1 :: V_2 : T_2$$

$$500 : \frac{7}{2} :: 100 : T_2$$

$$500 \times T_2 = \frac{7}{2} \times 100$$

$$T_2 = 100 \times \frac{7}{2} \times \frac{1}{500}$$

$$T_2 = \frac{7}{10} \text{ hrs}$$

$$= \frac{7}{10} \times 60 = 42 \text{ mins}$$

6 The mass of a disc cut from iron $m_1 = 1.80 \text{ kg}$

$$m \propto r^2$$

$$m_1 : r_1^2 :: m_2 : r_2^2$$

$$m_1 = 1.8 \text{ kg}$$

$$r_1 = 15 \text{ cm}$$

$$m_2 = 0.2$$

$$r_2 = ?$$

$$m \propto r^2$$

$$m_1 : r_1^2 :: m_2 : r_2^2$$

$$1.8 : 15^{-2} :: 0.2 : r_2^2$$

$$1.8 r_2^2 = 225 \times 0.2$$

$$r_2^2 = \frac{225 \times 0.2}{1.8} \times \frac{10}{10}$$

$$r_2^2 = \frac{25 \times 18}{1.8} \times 2 = 25$$

$$r_2^2 = 25$$

$$r_2 = \sqrt{25} = 5 \text{ cm}$$