CLASS-X (MATHS) CBA SYLLABUS AUGUST-2024

- **ARITHMETIC PROGRESSIONS , TRIANGLES**

Case Study :-

Your elder brother wants to buy a car and plans to take loan from a bank for his car. He repays his total loan of Rs 118,000 by paying every month starting with the first instalment of Rs 1000. If he increases the instalment by Rs 100 every month , answer the following:

(i) The amount paid by him in 30 th installment is

(A)3900

(B) 3500

(C) 3700

(D) 3600

(ii) The amount paid by him in the 30 installments is

(A)37000

(B) 73500

(C) 75300

(D) 75000

(iii) What amount does he still has to pay after 30 th installment?

(A)45500

(B) 49000

(C) 44500

(D) 54000.

(iv) If total installments are 40,then amount paid in the last installment is

(A)4900

(B) 3900

(C) 5900

(D) 9400.

(v) The ratio of the first installment to the last installment is:

(A) 1:49

(B) 10:49

(C) 10:39

(D) 39:10.

ANSWER:

(i) (A)3900

l = 1,18,000 a = 1000 d = 100

a_{30} = a + 29d = 1000 + 29(100) = 1000 + 2900 = 3900

(ii) (B) 73500

S_{30}= 30/2 [2000 + 2900] = 15[2000 + 2900] = 30000 + 43500 = 73500.

(iii) (C) 44500

Money remaining to pay after the 30^{th} payment = 118000 - 73500 = 44500.

(iv) (A)4900

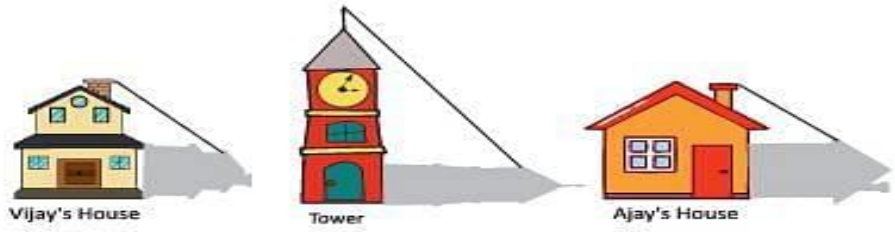
a_{40} = 1000 + 39(100) = 1000 + 3900 = 4900.

(v) (B) 10:49

a : a_{40} = 1000 : 4900 = 10 : 49.

Case Study :-

Vijay is trying to find the average height of a tower near his house. He is using the properties of similar triangles. The height of Vijay's house is 20m when Vijay's house casts a shadow 10m long on the ground. At the same time, the tower casts a shadow 50m long on the found. At the same time, the house of Ajay casts 20m shadow on the ground.



(i). What is the height of the tower?

(A) 20m

(B) 50m

(C) 100m

(D) 200m

(ii) What will be the length of the shadow of the tower when Vijay's house casts a shadow of 12m?

(A)75m

(B) 50m

(C) 45m

(D) 60m

(iii). What is the height of Ajay's house?

(A)30m

(B) 40m

(C) 50m

(D) 20m

(iv) When the tower cast shadow of 40m, same time what will be the length of the shadow of Ajay's house?

(A) 16m

(B) 32m

(C) 20m

(D) 8m

(v). When the tower cast shadow of 40m, same time what will be the length of the shadow of Vijay's house?

(A) 15m

(B) 32m

(C) 10m

(D) 8m

ANSWER:

(i) (C) 100m

When two corresponding angles of two triangles are similar, then ratio of sides are equal.

ANSWER:

(i) Since triangles are similar, their sides are proportional

$$\frac{Height\ of\ Vijay's house}{Length\ of\ shadow\ of\ Vijay's house} = \frac{Heigh\ of\ Tower}{Length\ of\ shadow\ of\ Tower}$$

$$\frac{20}{10} = \frac{Heigh\ of\ Tower}{50}$$, Height of Tower =100 m

(ii) (D) 60m

$$\frac{20}{12} = \frac{100}{Length\ of\ shadow\ of\ Tower}$$

Length of shadow of Tower = 60 m

(iii) (B) 40m

$$\frac{Height\ of\ Vijay's\ house}{Length\ of\ shadow\ of\ Vijay's\ house} = \frac{Heigh\ of\ Ajay's\ house}{Length\ of\ shadow\ of\ Ajay's\ house}$$

$$\frac{20}{10} = \frac{Heigh\ of\ Ajay's\ house}{20}$$

(iv) (A)16m

$$\frac{Height\ of\ tower}{Length\ of\ shadow\ of\ tower} = \frac{Heigh\ of\ Ajay's\ house}{Length\ of\ shadow\ of\ Ajay's\ house}$$

$$\frac{100}{40} = \frac{40}{Length\ of\ shadow\ of\ Ajay's\ house}$$

Length of shadow of Ajay's house= 16 m

(v) (D) 8m

$$\frac{Height\ of\ Vijay's house}{Length\ of\ shadow\ of\ Vijay's house} = \frac{Heigh\ of\ Tower}{Length\ of\ shadow\ of\ Tower}$$

$$\frac{20}{Length\ of\ shadow\ of\ Vijay's house} = \frac{100}{40}$$

Length of shadow of Vijay's house = 8 m.