KIRAN TUTORIALS

Seat No. | | | | | | | |

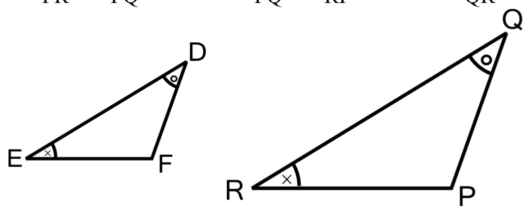
Std 10 (English) **Mathematics Part - II**

Time 1HRS	Chapter 1,	Marks 20

Q.1 **Multiple Choice Questions** **1**

1 If in $\triangle$ DEF and $\triangle$ PQR, $\angle D \cong \angle Q$, $\angle R \cong \angle E$ then which of the following statements is false?

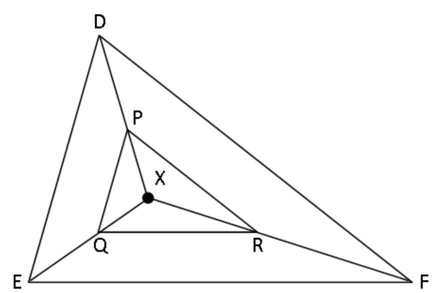
a. $\frac{EF}{PR} = \frac{DF}{PQ}$ b. $\frac{DE}{PQ} = \frac{EF}{RP}$ c. $\frac{DE}{QR} = \frac{DF}{PQ}$ d. $\frac{EF}{RP} = \frac{DE}{QR}$



Ans Option b.

Q.2 **Attempt the following (Activity)** **2**

1 In the figure, X is any point in the interior of triangle. Point X is joined to vertices of triangle. Seg PQ || seg DE, seg QR || seg EF. Fill in the blanks to prove that, seg PR || seg DF.



In Δ XDE, PQ $\parallel$ DE... ______

$\therefore$ ______ = ______ ... (I) (Basic proportionality theorem)

In Δ XEF, QR $\parallel$ EF ... Given

$\therefore$ $\frac{XQ}{QE}$ = ______ ... (II) (Basic proportionality theorem)

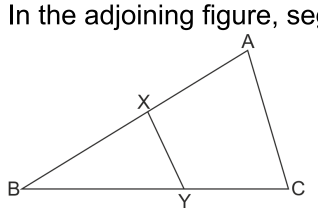
$\therefore$ ______ = $\frac{XR}{RF}$ ... from (I) and (II)

$\therefore$ seg PR $\parallel$ seg DF ... (Converse of basic proportionality theorem)

Ans 1) Given 2) $\frac{XP}{PD}$ 3) $\frac{XQ}{QE}$ 4) $\frac{XR}{RF}$ 5) $\frac{XP}{PD}$

Q.3 **Solve the following** **6**

1 In the adjoining figure, seg XY || seg AC, If 3AX = 2BX and XY = 9 then find the length of AC.



Ans 3AX = 2BX

$\therefore \frac{AX}{BX} = \frac{2}{3}$

$\therefore \frac{AX + BX}{BX} = \frac{3 + 2}{3}$ ... (By componendo)

$\therefore$

$\frac{AB}{BX} = \frac{5}{3}$

In $\triangle$ BCA and $\triangle$ BYX,

$\angle B \cong \angle B$

$\angle BCA \cong \angle BYX$ ... (Corresponding angles)

$\therefore$ $\triangle BCA \sim \triangle BYX$ ... (A-A test of similarity)

$\therefore$ $\frac{BA}{BX} = \frac{AC}{XY}$

$\therefore$ $\frac{5}{3} = \frac{AC}{9}$

$\therefore$ $3 \times AC = 45$

$\therefore$ AC = 15

2 Ratio of areas of two triangles with equal heights is 2 : 3. If base of the smaller triangle is 6 cm then what is the corresponding base of the bigger triangle?

Ans A(A1)A(A2) = 23 ... (given)

A(A1)A(A2) = b1b2 ... {heights are same, hence area proportional to bases}

$\therefore$ 23 = b1b2

As 2 < 3

$\therefore$ $b_1 < b_2$

$\therefore$ base of the smallest triangle = b_1 = 6cm.

$\therefore$ 23 = 6 b2

$\therefore$ $b_2 \times 2 = 3 \times 6$

$\therefore$ $b_{2 = 3 \times 62}$

$\therefore$ b_2 = 182

$\therefore$ b_2 = 9 cm.

$\therefore$ Corresponding base of bigger triangle is 9 cm.

Q.4 Answer the following (Non textual)(Any One) 4

1 A model of a ship is made in the ratio 1 : 200.

i) The length of the model is 4 m. calculate the length of the ship.

ii) The area of the deck of the ship is 1,60,000 m^2. Find the area of the deck of the model.

Ans Here, the k factor is 1 : 200.

$\therefore$ A ship and its model are similar figures.

$\therefore$ their corresponding sides are proportional

The model of a ship is made in the ratio 1 : 200.

$\therefore$ $\frac{\text{the length of the model}}{\text{the length of the ship}} = \frac{1}{200}$

$\therefore$ $\frac{4}{\text{the length of the ship}} = \frac{1}{200}$

$\therefore$ the length of the ship = 4×200

= 800 m

The ratio of the areas of similar figures is equal to the ratio of the squares of their corresponding sides

$\therefore$ $\frac{\text{the area of the deck of the model}}{\text{the area of the deck of the ship}} = \frac{1}{(k)^2}$

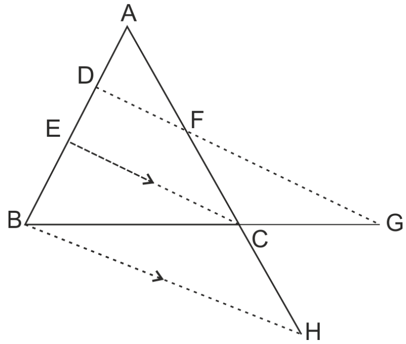
$\therefore$ $\frac{\text{the area of the deck of the model}}{160000} = \frac{1}{(200)^2}$

$\therefore$ the area of the deck of the model = $\frac{1 \times 160000}{200^2}$

= 1 × 16000040000 = $4m^2$

Processing math: 34%

2



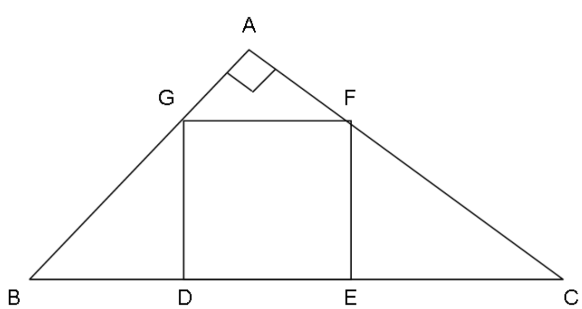
In the given figure, 2AD = BD, E is mid-point of BD and F is mid-point of AC and EC ∥ BH. Prove that :
i) DF ∥ BH
ii) AH = 3 AF.

Ans Given - E is the mid-point of BD and F is mid-point of AC also 2 AD = BD and EC ∥ BH.

To Prove : i) DF ∥ BH
ii) AH - 3 AF
Proof : i) E is the mid-point of BD (give)
∴ 2DE = BD ..... (1)
Also, 2AD = BD ..... (2)
From (1) and (2),
2 DE = 2 AD
DE = AD
Also F is the mid-point of AC (given)
∴ DF ∥ EC ..... (3)
Also EC ∥ BH ..... (4)
From (3) and (4)
∴ DF ∥ BH (proved)
Now E is mid-point of BD and EC ∥ BH (given)
C is mid-point of AH
FC = CH ..... (5)
But F is mid - point AC.
AF = FC ..... (6)
From (5) and (6), we get
FC = AF = CH
AF = 13 AH
3 AF = AH
AH = 3 AF

Q.5 **Answer the following** **4**

1



In the figure, the vertices of square DEFG are on the sides of △ ABC. ∠ A = 90°. Then prove that DE^2 = BD×EC

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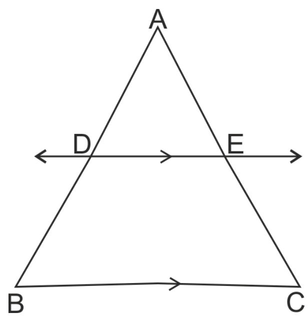
Ans In △ GBD and △ FGA
∠GBD ≅ ∠FGA ... (Corresponding angles)
∠GDB ≅ ∠FAG (90°)
∴ △ GBD ~ △ FGA ... (1) (A.A. test of similarity)
In △ FGA and △ CFE
∠FAG ≅ ∠CEF ... (90°)
∠GFA ≅ ∠FCE ... (Corresponding angles)
∴ △ FGA ~ △ CFE ... (2) (A.A. test of similarity)
∴ △ GBD ~ △ CFE ... (from (1) & (2))
GBCF = BDFE = GDCE ... (C. S.S.T.)
BDFE = GDCE
BD × CE = GD×FE ... (3)
□ DEFG is a square ... (given)
∴ GD ≅ FE ≅ DE ... {sides of square} ... (4)
∴ BD×CE = DE×DE (from 3 & 4)
∴ BD×CE = $(DE)^2$ ... hence proved

Q.6 **Answer the following** **3**

1



In the given figure. DE ∥ BC.
i. If AD = x, DB = x - 2, AE = x + 2 and
EC = x - 1, find the value x.
ii. If DB = x - 3, AB = 2x, EC = x - 2 and
AC = 2x + 3, find the value of x.

Ans In the given figure, DE ∥ BC
i) AD = x, DB = x - 2, AE = x + 2, EC = x - 1
In △ ABC,
∵ DE ∥ BC
∴ ADDB = AEEC
xx - 2 =x +2 x - 1 ..... (By cross multiplication)
x (x - 1) = (x - 2)) (x + 2)
$x^2 - x = x^2 - 4$
- x = - 4
x = 4
ii) DB = x - 3, AB = 2x
EC = x - 2, AC = 2x + 3
In △ ABC
∴ DE ∥ BC
∴ ABDB = ACEC
2x x - 3 = 2x + 3x - 2
Processing math: 34%
By cross multiplication

$2x\ (x - 2) = (2x + 3)\ (x - 3)$

$2x^2 - 4x = 2x^2 - 6x + 3x - 9$

$2x^2 - 4x - 2x^2 + 6x - 3x = - 9$

$- x = - 9$

$\therefore$ **$x = 9$**

Processing math: 34%