TEST

MATHEMATICS AND STATISTICS – 2

Chapter 1 - Similarity

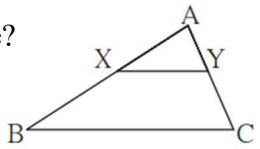
TIME : 2 Hrs **Marks : 40**

Q.1. A) Select the appropriate alternative. **[04]**

1) Δ ABC and Δ DEF are equilateral triangles, A (Δ ABC) : A(Δ DEF) = 1 : 2. If AB = 4 then what is length of DE?
(A) $2\sqrt{2}$ (B) 4 (C) 8 (D) $4\sqrt{2}$

2) In Δ ABC and Δ DEF $\angle B = \angle E$, $\angle F = \angle C$ and AB = 3DE then which of the statements regarding the two triangles is true ?
(A)The triangles are not congruent and not similar (B)The triangles are similar but not congruent.
(C)The triangles are congruent and similar. (D) None of the statements above is

3) In figure the figure, seg XY || seg BC, then which of the following statements is true?
(A) $\frac{AB}{AC} = \frac{AX}{AY}$ (B) $\frac{AX}{XB} = \frac{AY}{AC}$ (C) $\frac{AX}{YC} = \frac{AY}{XB}$ (D) $\frac{AB}{YC} = \frac{AC}{XB}$

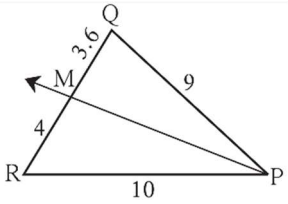


4) The ratio of corresponding sides of similar triangles is 3 : 5; then find the ratio of their areas .
(A) 9 : 25 (B) 3 : 5 (C) 6 : 10 (D) 18 : 50

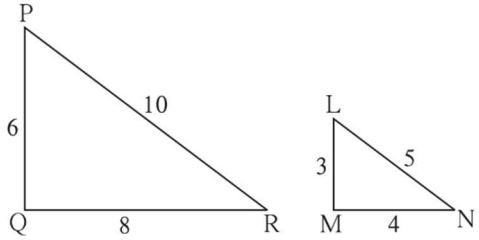
Q.1. B) Solve the following sub-questions **[04]**

1) 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 ?

2) From the given triangle lengths of line segments are given. Identify whether ray PM is the bisector of Δ QPR.



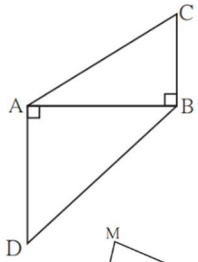
3) Are the triangles similar ? If yes by which test ?



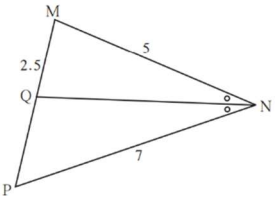
4) If ΔABC ~ ΔPQR and AB: PQ = 2:3, then fill in the blanks. $\frac{\Delta(ABC)}{\Delta(PQR)} = \frac{AB^2}{\square} = \frac{2^2}{3^2} = \frac{\square}{\square}$

Q.2. A) Solve the following questions **[04]**

1) In the figure, BC $\perp$ AB, AD $\perp$ AB, BC = 4, AD = 8, then find $\frac{A(\Delta\ ABC)}{A(\Delta\ ADB)}$



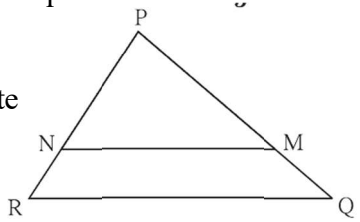
2) In Δ MNP, NQ is a bisector of $\angle N$. If MN = 5, PN = 7 MQ = 2.5 then find QP



Q.2. B) Solve the following sub-questions **[06]**

1) Areas of two similar triangles are 225 sq.cm. and 81 sq.cm. If a side of the smaller triangle is 12 cm, then find corresponding side of the bigger triangle.

2) In Δ PQR, PM = 15, PQ = 25, PR = 20, NR = 8. State whether line NM is parallel to side RQ. Give reason.



3) Δ LMN ~ Δ PQR, 9 × A (Δ PQR) = 16 × A (Δ LMN). If QR = 20 then find MN.

Q.3. A) Complete the following activity **[03]**

1) In figure, seg PQ || seg DE, A(Δ PQF) = 20 units, PF = 2 DP, then find A(□ DPQE) by completing the following activity.

A(Δ PQF) = 20 units, PF = 2 DP, Let us assume DP = x. $\therefore$ PF = $2x$

DF = DP + ☐ = ☐ + ☐ = $3x$

In Δ FDE and Δ FPQ,

$\angle$ FDE $\cong$ $\angle$ ..... corresponding angles

$\angle$ FED $\cong$ $\angle$ ..... corresponding angles

$\therefore$ Δ FDE ~ Δ FPQ ..... AA test

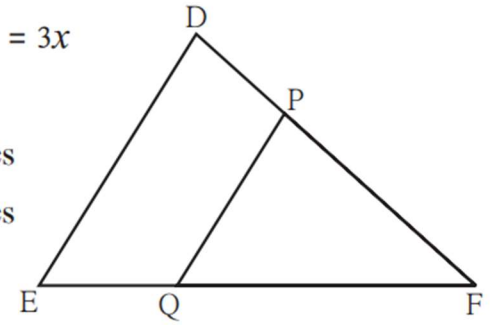
$\therefore \frac{A(\Delta FDE)}{A(\Delta FPQ)} = \frac{\square}{\square} = \frac{(3x)^2}{(2x)^2} = \frac{9}{4}$

$A(\Delta FDE) = \frac{9}{4} A(\Delta FPQ) = \frac{9}{4} \times \square = \square$

A(□ DPQE) = A(Δ FDE) – A(Δ FPQ)

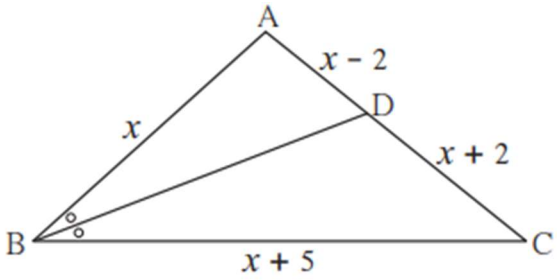
= ☐ – ☐

= ☐

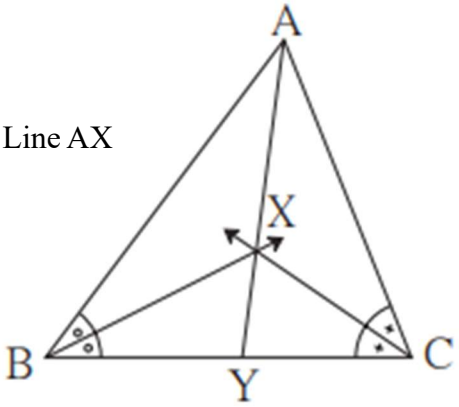


Q.3. B) Solve the following questions **[06]**

1) In Δ ABC, seg BD bisects Δ ABC. If AB = x, BC = x + 5, AD = x – 2, DC = x + 2, then find the value of x.



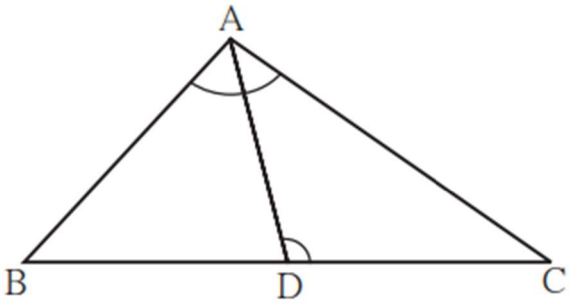
2) In the figure, bisectors of $\angle$B and $\angle$C of Δ ABC intersect each other in point X. Line AX intersects side BC in point Y. AB = 5, AC = 4, BC = 6 then find $\frac{AX}{XY}$.



Q.4. Solve the following questions **[08]**

1) In ∆ ABC, ray BD bisects ∠ABC and ray CE bisects ∠ACB. If seg AB ≅ seg AC then prove that ED || BC.

2) In the figure, in ∆ ABC, point D on side BC is such that, ∠ BAC = ∠ ADC. Prove that, CA2 = CB × CD



Q.5. Solve the following question **[03]**

1) In the figure, seg PA, seg QB, seg RC and seg SD are perpendicular to line AD. AB = 60, BC = 70, CD = 80, PS = 280 then find PQ, QR and RS.