Gurukul Academy

Weekly Test

Std: SSC	**Subject: Geometry**	**Time: 2Hrs**
Date : 12/May/2019	**ch-1**	**Max Marks: 40**

Q.1 Solve the following questions (9th std) (ANY FOUR) **4**

1) Fill in the blanks: tan 30°x tan ______° = 1

2) Fill in the blanks: sin 20° = cos _______°

3) Find the values of: 2 sin 30° + cos 0° + 3 sin 90°

4) Write the answers to the following question with reference to figure below:

Write the intersection set of ray SP and ray ST.

5) Write the following statements in 'if-then' form: The opposite angles of a parallelogram are congruent.

6) Write the answers to the following question with reference to figure below:

Write any two rays with common end point S.

Q.2 Solve the following questions (9th std) (ANY TWO) **4**

1) Diagonals of a parallelogram bisect each other.

2) U, V and A are three cities on a straight road. The distance between U and A is 215 km, between V and A is 140 km and between U and A is 75 km. Which of them is between the other two ?

3) □PQRS is a parallelogram. PQ = 3.5, PS = 5.3 ∠Q - 50° then find the lengths of remaining sides and measures of remaining angles.

Q.3 Choose the correct alternative: **5**

1) Sides of two similar triangles are in the ration of 4 : 9. Areas of these triangles are in the ratio:
(a) 2 : 3 (b) 4 : 9 (c) 81 : 16 (d) 16 : 81

2) ΔABC and ΔBDE are two equilateral triangles such that D is the mid-point of BC. The ratio of the areas of triangles ABC and BDE is :
(a) 2 : 1 (b) 1 : 2 (c) 4 : 1 (d) 1 : 4

3) ΔABC is such that AB = 3 cm, BC = 2 cm and CA = 2.S cm. If ΔDEF ~ ΔABC and EF = 4 cm, then perimeter of ΔDEF is
(a) 7.5 cm (b) 15 cm (c) 22.5 cm (d) 30 cm

4) Two poles of height 6 m and 11 m stand vertically upright on a plane ground. If the distance between their foot is 12 m, the distance between their tops is
(a) 12 m (b) 14 m (c) 13 m (d) 11 m

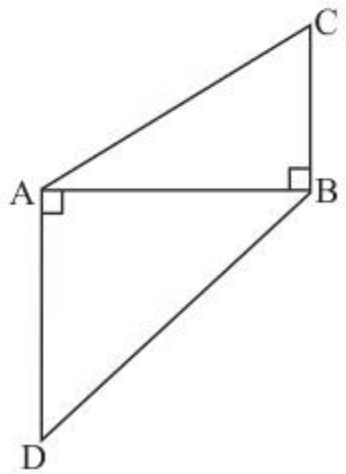
5) In a ΔABC, AD is the bisector of ∠BAC. If AB = 6 cm, AC = 5 cm and BD = 3 cm, then DC =
(a) 11.3 cm
(b) 2.5 cm
(c) 3.5 cm
(d) None of these

Q.4 Solve the following questions (ANY TWO) **4**

1) Base of a triangle is 9 and height is 5. Base of another triangle is 10 and height is 6. Find the ratio of areas of these triangles.

2) In figure given below BC $\perp$ AB, AD $\perp$ AB, B = 4, AD = 8, then find

$$\frac{A(\Delta ABC)}{A(\Delta ADB)}$$

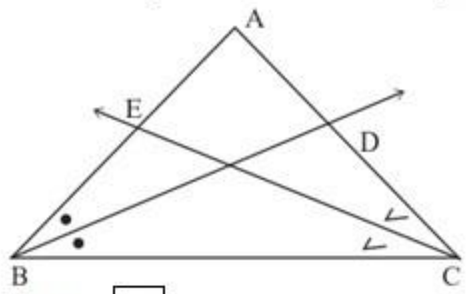


3) If a line divides any two sides of a triangle in the same ratio, then the line is parallel to the third side.

Q.5 Complete the following Activities (ANY FOUR) **8**

1) In ΔABC, ray BD bisects $\angle ABC$ and ray CE bisects $\angle ACB$. If seg AB $\cong$ seg AC then prove that ED $\parallel$ BC.

In ΔABC, ray BD bisects $\angle \square$ [Given]



$\therefore \frac{AB}{BC} = \frac{\square}{DC}$

.... 1 [Angle bisector property of a triangle]

In ΔABC, ray CE bisects $\angle ACB$ [Given]

$\therefore \frac{AC}{\square} = \frac{AE}{BE}$

.... 2 [Angle bisector property of a triangle]

seg AB $\cong$ seg $\square$ ...... 3 [Given]

$\therefore \frac{AB}{BC} = \frac{AE}{\square}$ ...... 4 [From 2 & 4]

In ΔABC, $\frac{AD}{DC} = \frac{\square}{BE}$ [From 1 & 4]

$\therefore$ seg $\square \parallel$ side BC [Converse of B.P.T.]

2) The ratio of corresponding sides of similar triangles is 3 : 5; then find the ratio of their areas.

Let Δ_1 and Δ_2 be two similar triangles with their corresponding sides s_1 and s_2 respectively.

$\frac{s_1}{s_2} = \square$ [Given] 1

$\Delta_1 \sim \Delta_2$ [Given]

$\frac{\square}{A(\Delta_2)} = \frac{S_1^2}{\square}$

[Theorem on areas of similar triangles]

$\frac{A(\Delta_1)}{A(\Delta_2)} = \square$ [From 1]

$\therefore A(\Delta_1)\ A(\Delta_2) = \square$

3) Δ LMN ~ ΔPQR, 9 x A(ΔPQR) = 16 x A(ΔLMN). If QR = 20 then find MN.

9 x A (ΔPQR) = $\square$ x A(ΔLMN) .... (Given)

$\therefore \frac{9}{16} = \frac{A(\Delta LMN)}{A(\Delta \square)}$

i.e. $\frac{A(\Delta LMN)}{A(\Delta PQR)} = \frac{\square}{16}$ ..... (i)

In ΔLMN and ΔPQR, ...(Given)

$\frac{A(\Delta LMN)}{A(\Delta PQR)} = \frac{MN^2}{QR^2}$ ...... (Theorem on areas of similar triangles)

$\therefore \square = \frac{MN^2}{20^2}$

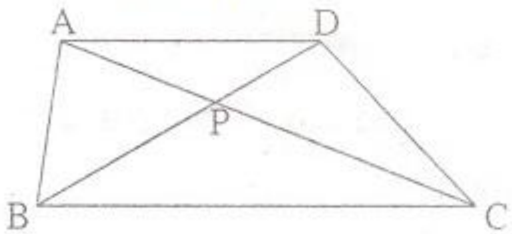
$\therefore \square = \frac{MN}{20}$ .... (Taking square roots)

$\therefore MN = \frac{3 \times \square}{4}$

$\therefore MN = \square$

$\therefore MN = \square$ units

4) In □ ABCD, seg AD ∥ seg BC. Diagonal AC and diagonal BD intersect each other in point P. Then show that $\frac{AP}{PD} = \frac{PC}{BP}$



seg AD ∥ seg $\square$ [Given]

∴ ∠$\square$ ≅ ∠PCB

......1 [Alternate angles theorem]

In ΔAPD & ΔCPB

(i) ∠PAD ≅ ∠$\square$ [From 1]

(ii) ∠APD ≅ ∠CPB

[$\square$]

∴ ΔAPD ~ ΔCPB [AA test]

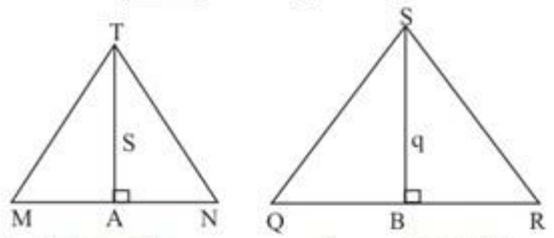
$\therefore \frac{AP}{CP} = \frac{\square}{PB}$

$\therefore \frac{AP}{PD} = \frac{\square}{PB}$ [Alternando]

i.e. $\frac{AP}{PD} = \square$

5) ΔMNT ~ ΔQRS. Length of altitude drawn from point T is 5 and length of altitude drawn from point S is 9. Find the ratio $\frac{A(\Delta MNT)}{A(\Delta QRS)}$.

ΔMNT ~ Δ$\square$ [Given]



∴ ∠M ≅ ∠Q .... 1 [c.a.s.t]

In ΔMAT & ΔQBS

∠M ≅ $\square$ [From 1]

∠MAT ≅ ∠$\square$ [Each 90°]

∴ ΔMAT ~ ΔQBS

$\therefore \frac{TM}{SQ} = \square$ .... 2 [c.s.s.t]

$\therefore \frac{A(\Delta TMN)}{A(\Delta SQR)} = \frac{\square}{SQ^2}$

[Theorem on areas of similar triangles]

$\therefore \frac{A(\Delta TMN)}{A(\Delta SQR)} = \frac{TA^2}{\square}$ [From 2]

$\therefore \frac{A(\Delta TMN)}{A(\Delta SQR)} = \frac{5^2}{\square}$

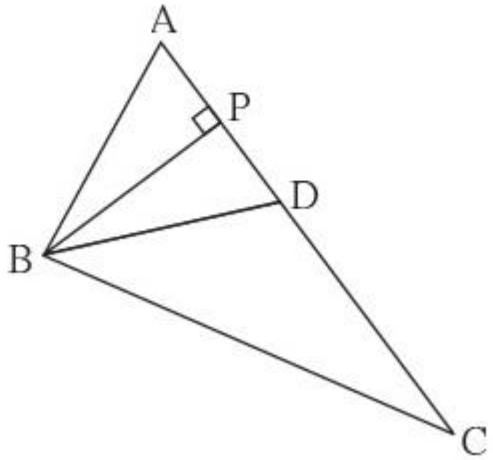
$\frac{A(\Delta TMN)}{A(\Delta SQR)} = \frac{25}{\square}$

Q.6 Solve the following questions 15

1) In Δ ABC point Δ on side BC is such that DC = 6, BC = 15. Find A(Δ ABD) : A(Δ ABC) and A(Δ ABD) : A(Δ ADC) .

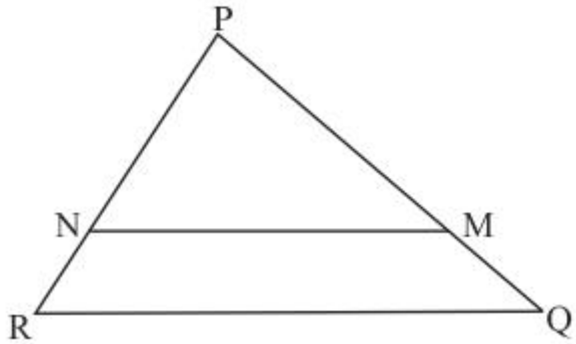
2) In below figure in Δ ABC, point D is on side AC. If AC = 16, DC = 9 and BP ⊥ AC, then find the following ratios.

(i) $\frac{A(\Delta ABD)}{A(\Delta ABC)}$ (ii) $\frac{A(\Delta BDC)}{A(\Delta ABC)}$ (iii) $\frac{A(\Delta ABD)}{A(\Delta BDC)}$

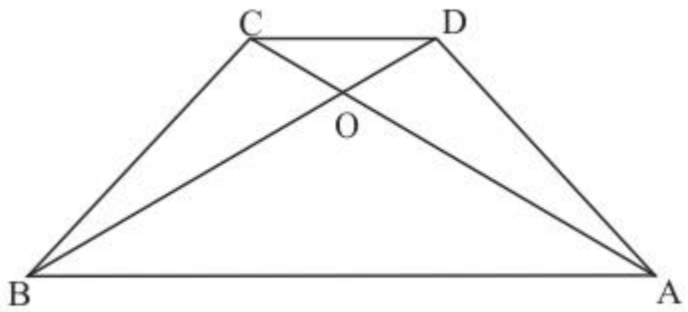


3) If a line parallel to a side of a triangle intersects the remaining sides in two distinct points, then the line divides the sides in the same proportion.

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



5) In trapezium ABCD, side AB ‖side DC, diagonals AC and BD intersect in point O. If AB = 20, DC = 6, OB = 15 then find OD.



-------- All the Best --------