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CULTIVATING SUCCESS SINCE 1998

Subject : Geometry **Total Marks : 40**

Class : X^th **Prelim Question Paper - 1** **Time : 2 Hr.**

Q.1 : A) Solve Multiple choice questions.4

1) Ratio of areas of two similar tringles is 9:25. ..... is the ratio of their corresponding sides.

a) 3:4 b) 3:5

c) 5:3 d) 25:81

2) What is side and perimeter of square having diagonal $5\sqrt{2}$ cm.

a) 5 and $20\sqrt{5}$ cm

b) 5 and 20 cm

c) 10 cm and $20\sqrt{5}$ cm

d) $10\sqrt{2}$ cm and 20 cm

3) Two circles of radii 5.5 cm and 4.2 cm touch each other externally. Find the distance between their centres.

a) 9.7 b) 1.3

c) 2.6 d) 4.6

4) When we see at a higher level, from the horizontal line, angle formed is _____

a) angle of elevation.

b) angle of depression.

c) 0 d) straight angle.

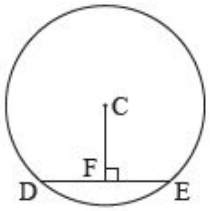
B) Solve the following questions. 4

1) Construct $\angle ABC = 60^0$ and bisect it.

2) $\triangle ABC$ and $\triangle DEF$ are equilateral triangles, $A(\triangle ABC) : A(\triangle DEF) = 1 : 2$. If AB = 4, then what is length of DE?

3) Identify, with reason, if the following is Pythagorean triplet. 3, 5, 4

4) In the adjoining figure, seg DE is the chord of the circle with center C. Seg CF $\perp$ seg DE and DE = 16 cm, then find the length of DF.

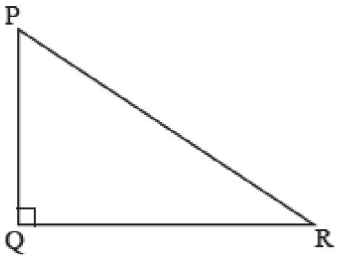


Q.2 : A) Complete the following Activities. (Any two) 4

1) A ladder 10 m long reaches a window 8 m above the ground. Find the distance of the foot of the ladder from the base of wall. Complete the given activity.

As show in fig.,

Suppose PR is the length of ladder = 10 m



At P - Window, At Q - base of wall, At R - foot of ladder

$\therefore$ PQ = 6m

$\therefore$ QR = ?

In $\angle PQR$, $m\angle PQR = 90^0$

$\therefore$ By Pythagoras theorem,

$= \pi(r_1 + r_2)l$ ... (1)

Here, PR = 10, PQ = $\square$

$\therefore$ From equation (1)

$8^2 + QR^2 = 10^2$

$\therefore$ $QR^2 = \square - \square$

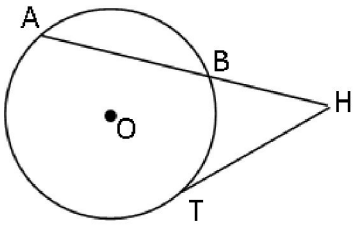
$\therefore$ $QR^2 = 100 - 64$

$\therefore$ $QR^2 = \square$

$\therefore$ $QR^2 = 6$

$\therefore$ The distance of foot of the ladder form the base of wall is 6 m.

2) In the figure, T is the point of contact. HA = 9 cm and HB = 4 cm. Find HT.



HT is a tangent segment and HBA is the secant. By tangent secant property,

$HT^2 = \square$

$= 4 \times \square$

$= \square$

$\therefore$ HT = $\square$ cm ... (Taking square root of both the sides)

3) Complete the following activity to find the coordinates of point P which divides seg AB in the ratio 3 : 1 where A (4, - 3) and B (8, 5)

$\therefore$ By section formula,

$\therefore$ $x = \dfrac{mx_2 + nx_1}{\square}$,

$\therefore$ $x = \dfrac{3\times 8 + 1\times 4}{3+1}$,

$= \dfrac{24+4}{4}$

$\therefore$ $x = \dfrac{28}{4}$,

$\therefore$ $x = 7$

$y = \dfrac{\square + \square}{m+n}$

$y = \dfrac{3\times 5 + 1\times(-3)}{3+1}$

$= \dfrac{\square - 3}{4}$

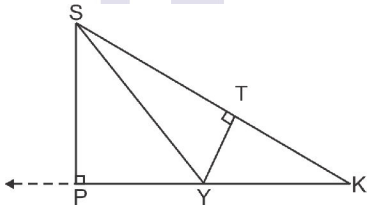
$\therefore$ $y = \dfrac{12}{4}$

$y = 3$

B) Solve the following questions. (Any four) **8**

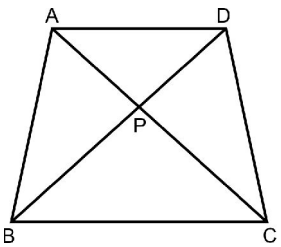
1) In the figure, seg SP $\perp$ side YK and seg YT $\perp$ side SK.

If SP = 6, YK = 13, YT = 5 and TK = 12, then find A (ΔSYK) : A(ΔYTK).



2) Find the length of the hypotenuse of a square whose side is 16 cm.

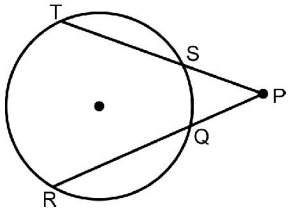
3)



In □ABCD, seg AD || seg BC. Diagonal AC and diagonal BD intersect each other in point P.

Then show that $\frac{AP}{PD} = \frac{PC}{BP}$.

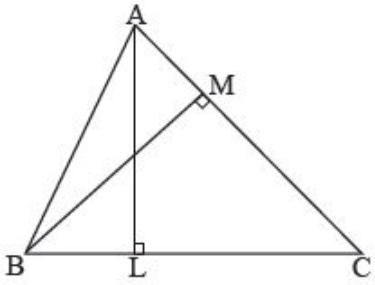
4) In figure if PQ = 6, QR = 10, PS = 8 find TS.



5) If the slope of the line joining points (k, – 3) and (4, 5) is $\frac{1}{2}$, then find the value of k.

Q.3 : A) Complete the following activity. (Any one) 3

1) In ΔABC, $AL \perp BC$ and $BM \perp AC$, $B - L - C$, $A - M - C$. Then show that $\Delta ALC - \Delta BMC$. If AL = 7, BM = 8, and BC = 12, then find AC. Complete the following activity.



In ΔALC and ΔBMC,

$\angle CLA = \angle CMB$ ... □

$\angle ACL = \angle$ □ ... (common angle)

$\therefore \Delta CLA - \Delta CMB$ ... □

$\therefore \frac{AL}{BM} = \frac{AC}{\square}$ ... □

$\therefore \frac{7}{8} = \frac{AC}{12}$

$\therefore$ AC = □

2) Radii of the top and the base of a frustum are 14 cm, 8 cm respectively. Its height is 8 cm.

Find its

i) curved surface area

ii) total surface area

iii) volume.

$r_1 = 14$ cm , $r_2 = 8$ cm, h = 8 cm

Slant height of the frustum = l

= □ .....Formula

$= \sqrt{8^2 + (14-8)^2}$

$= \sqrt{64 + 36}$

= □

Curved surface area of the frustum

$= = \pi(r_1 + r_2)l$

$= 3.14 \times (14 + 8) \times 10$

= □

Total surface area of frustum = □

$= 3.14 \times 10\ (14 + 8) + 3.14 \times 14^2 + 3.14 \times 8^2$

$= 690.8 + 615.44 + 200.96$

$= 690.8 + 816.4$

$= 1507.2$

Volume of the frustum = □

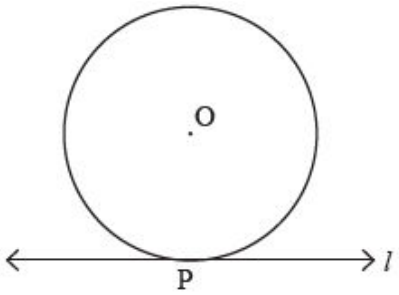
$= \frac{1}{3} \times 3.14 \times 8\ (14^2 + 8^2 + 14 \times 8)$

= □

B) Solve the following questions. (Any two) 6

1) Find the ratio in which point P (k, 7) divides the segment joining A (8, 9) and B (1, 2). Also find k.

2) Line l touches a circle with centre O at point P. If radius of the circle is 9 cm, answer the following.



i) What is d(O, P) = ? Why?

ii) If d(O, Q) = 8 cm, where does the point Q lie?

iii) If d(OR) = 15 cm, how many locations of point R are line on line l ? At what distance will each of them be from point P?

3) If $\cos A + \cos^2 A = 1$ then

$\sin^2 A + \sin^4 A = ?$

4) Do the following activity to draw tangents to the circle without using center of the circle.

a) Draw a circle with radius 3.5 cm and take any point C on it.

b) Draw chord CB and an inscribed angle CAB.

c) With the center A and any convenient radius draw an arc intersecting the sides of angle BAC in points M and N.

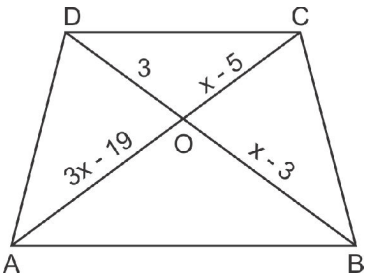
d) Using the same radius and center C, draw an arc intersecting the chord CB at point R.

Taking the radius equal to d(MN) and center R, draw an arc intersecting the arc

e) drawn in the previous step. Let D be the point of intersection of these arcs. Draw line CD. Line CD is the required tangent to the circle.

Q.4 : Solve the following questions. (Any two) 8

1) In the figure, seg AB || seg DC. Using the information given find the value of x.



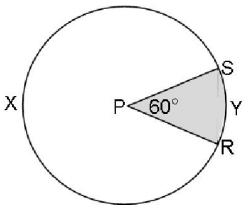
2) The radius of the circle is 7 cm and m (arc RYS) = 60° with the help of the fig, answer the following question:

i. Name the shaded protion.

ii. Find the area of the circle.

iii. Find A(P-RYS)

iv. Find A(P-RXS)



3) A tree was broken due to storm. Its broken upper part was so inclined that its top touched the ground making an angle of 30°with the ground.The distance from the foot of the tree and the point where the top touched the ground was 10 metre. What was the height of the tree?

Q.5 : Solve the following questions. (Any one) **3**

1) Draw ΔABC such that, AB = 8, BC = 6 cm and $\angle B = 90°$. Draw seg BD perpendicular to hypotenuse AC. Draw a circle passing through points B, D, A. Show that line CB is a tangent of the circle.

2) The surface area of a solid metallic sphere is $616 cm^2$. It is melted and recast into smaller spheres of diameter 3.5cm. How many such spheres can be obtained?

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