PARISHRAM PUBLICATIONS

Std.: X (English)	Mathematics Part - II	Marks: 40
Date: 14-Dec-2019	Parishram Academy	Time: 2 hrs
	Chapter: All	

Note:-

Q.1 A) Solve Multiple choice questions. **(4)**

1) $(\cos\theta + \sin\theta)^2 + (\cos\theta - \sin\theta)^2$ is equal to
a. -2 b. 0 c. 1 d. 2

2) A circle touches all sides of a parallelogram. So the parallelogram must be a ..... .
a. rectangle b. rhombus c. square d. trapezium

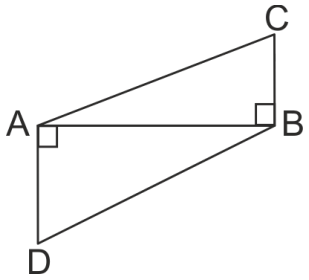
3) Find the ratio of the volumes of a cylinder and a cone having equal radius and equal height.
a. 1 : 2 b. 2 : 1 c. 1 : 3 d. 3 : 1

4) If in two triangles ABC and PQR,
$\frac{AB}{QR} = \frac{BC}{PR} = \frac{CA}{PQ}$, then
a. $\triangle PQR \sim \triangle CAB$ B. $\triangle PQR \sim \triangle ABC$ C. $\triangle CBA \sim \triangle PQR$ D. $BCA \sim \triangle PQR$

B) Solve the following questions. **(4)**

1) Identify, with reason, if the following is Pythagorean triplet. 4, 9, 12

2) In the given figure, $CB \perp AB$, $DA \perp AB$. If BC = 4, AD = 8 then $\frac{A(\triangle ABC)}{A(\triangle ADB)}$ find.

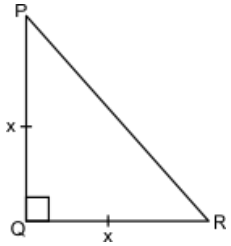


3) Area of a sector of a circle of radius 15 cm is 30 cm^2. Find the length of the arc of the sector.

4) Prove the following
$\tan^4\theta + \tan^2\theta = \sec^4\theta - \sec^2\theta$

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

1) A side of an isosceles right angled triangle is x. Find its hypotenuse.



In $\triangle PQR$, $\angle PQR = 90°$

and PQ = QR = x

$\therefore$ PR^2 = _____ ... [Pythagoras theorem]

= _____

$\therefore$ PR^2 = _____

$\therefore$ PR = _____units ... [Taking square root]

$\therefore$ The length of hypotenuse is _____ units.

2) If $\sin\theta = \frac{11}{61}$ then find the value of $\cos\theta$ using identity.

$\sin^2\theta + \cos^2\theta = 1$ ... [Trigonometric identity]

$\therefore$ $\cos^2\theta$ = _____

= 1 - _____

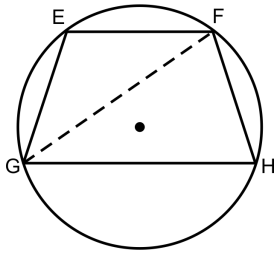
= $1 - \frac{121}{3721}$

= _____

$\therefore$ $\cos^2\theta$ = _____

$\therefore$ $\cos\theta$ = _____ ... [Taking square root]

3)



In chord EF || chord GH. Prove that, chord EG $\cong$ chord FH.
Fill in the blanks and write the proof.

Proof : Draw seg GF.

$\angle EFG = \angle FGH$ ... .(I)

$\angle EFG$ = ... inscribed angle theorem (II)

$\angle FGH$ = ... inscribed angle theorem (III)

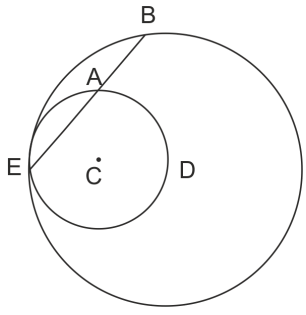
$\therefore$ m(arc EG) = ... from (I), (II), (III).

$\therefore$ chord EG $\cong$ chord FH ... .

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

1) The diameter of a circle is 10 cm. Find the length of the arc, when the corresponding central angle is 144° (π = 3.14).

2)



In the figure circles with centres C and D touch internally at point E. D lies on the inner circle. Chord EB of the outer circle intersects inner circle at point A. Prove that, seg EA $\cong$ seg AB.

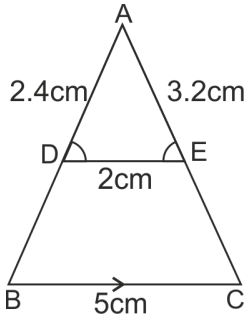
3) Draw a circle of radius 3.6. Draw a tangent to the circle at any point on it without using centre.

4) Find the length of altitude of an equilateral triangle having side 2a.

5) Find the centroids of the triangles whose vertices are given below.
$(3, -5), (4, 3), (11, -4)$

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

1) In a $\triangle ABC$, D and E are points on the sides AB and AC respectively such that DE $\parallel$ BC. If AD = 2.4 cm, AE = 3.2 cm, DE = 2 cm and BC = 5 cm, find the BD and CE.



In $\triangle ABC$

$\because$ DE $\parallel$ BC

$\therefore$ $\frac{AD}{AB}$ = _____

$\frac{2.4}{AB} = \frac{3.2}{AC} = \frac{2}{5}$

$\frac{2.4}{AB} = \frac{2}{5}$

AB = _____

= 6cm

$\frac{3.2}{AC} = \frac{2}{5}$

and AC = _____ = 8cm

$\therefore$ BD = _____

= 6 - 2.4

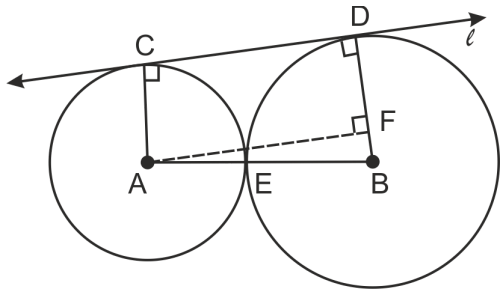
= _____

and CE = AC - AE

= 8 - 3.2

= _____

2) In the circles with centres A and B touch each other at E. Line l is a common tangent which touches the circles at C and D respectively. Find the length of seg CD if the radii of the circles are 4 cm, 6 cm.



Construction: Draw seg AF $\perp$ seg BD

$\therefore$ $\square AFDC$ is a rectangle.

A - E - B ... [_____]

$\therefore$ _____ = AB ... [A - E - B]

4 + 6 = AB

AB = 10cm

Now, in $\triangle AFB$, $\angle AFB = 90^\circ$ .... [Construction]

AB^2 = _____ .... [Pythagoras Theorem]

$\therefore$ $10^2 = AF^2 + 2^2$ BF = _____

$AF^2 = 96$

$\therefore$ AF = _____

But, CD = AF

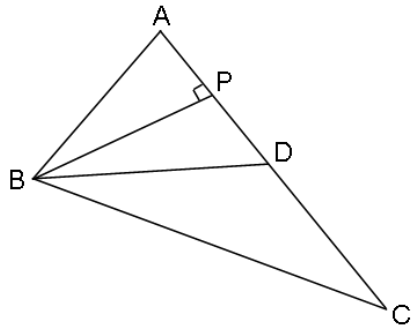
$\therefore$ CD = _____

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

1) Prove the following.

$$\frac{\sin A + \cos A}{\sin A - \cos A} + \frac{\sin A - \cos A}{\sin A + \cos A} = \frac{2}{\sin^2 A - \cos^2 A}$$

2)



In adjoining figure in $\triangle ABC$, point D is on side AC. If AC = 16, DC = 9 and BP $\perp$ AC, then then find the following ratios.

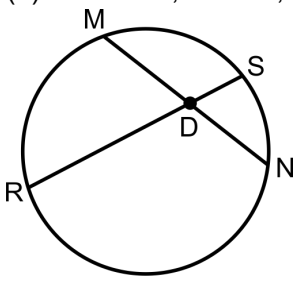
i. $\frac{A(\triangle ABD)}{A(\triangle ABC)}$ ii. $\frac{A(\triangle BDC)}{A(\triangle ABC)}$ iii. $\frac{A(\triangle ABD)}{A(\triangle BDC)}$

3) Draw a circle with centre P and radius 3.4 cm. Take point Q at a distance 5.5 cm from the centre. Construct tangents to the circle from point Q.

4) In figure, chord MN and chord RS intersect at point D.

(1) If RD = 15, DS = 4, MD = 8 find DN

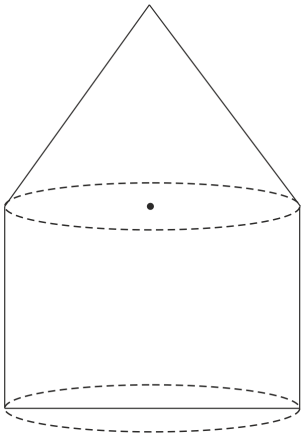
(2) If RS = 18, MD = 9, DN = 8 find DS



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

1) Find the equation of the line passing through the point of intersection of the line 4x + 3y + 2 = 0 and 6x + 5y + 6 = 0 and the point of intersection of the lines 4x - 3y - 17 = 0 and 2x + 3y + 5 = 0.

2)



A cylinder and a cone have equal bases. The height of the cylinder is 3 cm and the area of its base is 100 cm^2.The cone is placed upon the cylinder. Volume of the solid figure so formed is 500 cm^3. Find the total height of the figure.

3) Prove that the sum of the squares of the diagonals of a parallelogram is equal to the sum of the squares of its sides.

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

1) A building has 8 right cylindrical pillars whose cross sectional diameter is 1 m and whose height is 4.2 m. Find the expenditure to paint these pillars at the rate of Rs. 24 per m^2.

2) Find the coordinates of point P if P divides the line segment joining the points.
A (-1,7) and B (4,- 3) in the ratio 2 : 3.