B.KUMAR'S ACADEMY

Sub : Math-II **Max Marks : 40**

Class : X (State Board) **Pre. Question Paper - 01** **Time : 2 hours**

General Instructions :

Read the following instructions carefully and follow them:

1. All questions are compulsory.**2.** Use of a calculator is not allowed. **3.** The numbers to the right of the questions indicate Full marks. **4.** In case of MCQs [Q. No. 1 (A)) only the first attempt will be evaluated and will be given credit. **5.** For every MCQ, the correct alternatives (A), (B), (C) or (D) with sub-question number is to be written as an answer. **6.** Draw proper figures for answers wherever necessary. **7.** The marks of construction should be clear. Do not erase them. **8.** Diagram is essential for writting the proof of the theorem.

Q.1A)Solve Multiple choice Questions.[4]

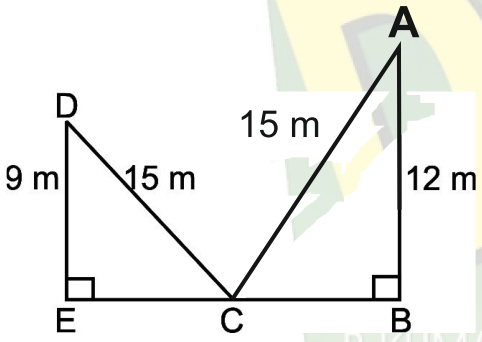
1) If $\Delta ABC \sim \Delta PQR$ and AB:PQ = 3:4

then $A(ABC):A(PQR)=?$

a) 9:25 b) 9:16

c) 16:9 d) 25:9

2)



A ladder reaches a window 12 m above the ground on one side of the street. Keeping its foot at the same point, the ladder is turned to the other side of the street to reach a window 9 m high. If the length of the ladder is 15m, then the width of the street is

a) 30 m b) 24 m

c) 21 m d) 18 m

3) $\angle ACB$ is inscribed in arc ACB of a circle with centre O. If $\angle ACB = 65^0$, find m(arc ACB).

a) 65^0 b) 130^0

c) 295^0 d) 230^0

4) $1+\cot^2\theta=?$

a) $\cot^2\theta$ b) $\text{cosec}^2\theta$

c) $\sec^2\theta$ d) $\tan^2\theta$

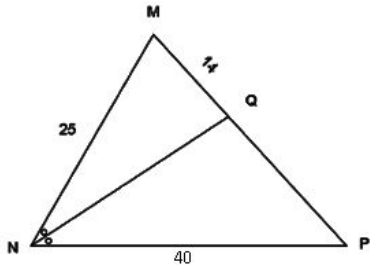
B) Solve the following questions. (4)

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) Radius of a circle is 21 cm. If length of arc of that sector is 55 cm, find the area of the sector.

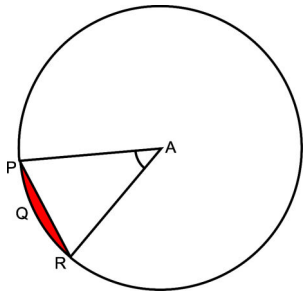
3) Draw a tangent at any point R on the circle of radius 3.4 cm. and centre 'P'.

4) Find QP using given information in the figure. MN = 25 units, MQ = 14 units and NP = 40 units.



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

1) In the figure, if A is the centre of the circle. $\angle PAR = 30°, AP = 7.5,$ find the area of the segment PQR $(\pi = 3.14)$



The radius of the circle (r) = AP = 7.5

m(arc PQR) = $\Delta\angle PAR = \theta = 30°$

Area of the segment PQR = r^2

$= r^2\left(\frac{\pi\theta}{360} - \frac{\square}{2}\right)$

$= \square^2\left[\frac{\pi\times 30}{360} - \frac{\sin 30}{2}\right]$

$= 56.25\left(\frac{3.14}{12} - \frac{1}{4}\right)$

$= 56.25\times\square$

$= \square\ cm^2$

2) Prove the following

$$\frac{1}{1-\sin\theta} + \frac{1}{1+\sin\theta} = 2\sec^2\theta$$

Solution:

$$LHS = \frac{1}{1-\sin\theta} + \frac{1}{1+\sin\theta}$$

$= \square$

$= \square$ $\quad \ldots\left[(a+b)(a-b) = a^2 - b^2\right]$

$= \frac{2}{\cos^2\theta}$ $\quad \ldots\left[\sin^2\theta + \cos^2\theta = 1\right]$

$= \square$

$= \square$

$\therefore LHS = RHS$

$\therefore \frac{1}{1-\sin\theta} + \frac{1}{1+\sin\theta} = 2\sec^2\theta$

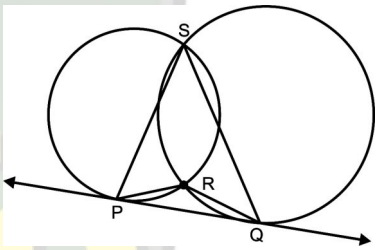
3) If $\Delta ABC \sim \Delta PQR$ and AB : PQ = 2 : 3, then fill in the blanks.

$$\frac{A(\Delta ABC)}{A(\Delta PQR)} = \frac{\square}{\square} = \frac{2^2}{3^2} = \frac{\square}{\square}$$

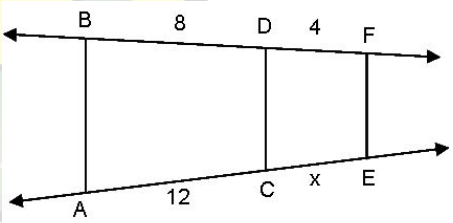
B) Solve the following questions. (Any four) (8)

1) Find k if the line passing through points $P(-12,-3)$ and $Q(4,k)$ has slope $\frac{1}{2}$.

2) If two circles intersect each other at points S and R. Their common tangent PQ touches the circle at points P, Q. Prove that, $\angle PRQ + \angle PSQ = 180°$



3) In figure, if AB || CD || FE then find x and AE.



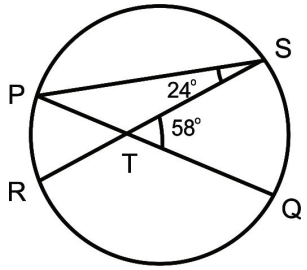
4) Draw a circle of radius 3.6. Draw a tangent to the circle at any point on it without using centre.

5) For a person standing at a distance 80m from a church the angle of the elevation of its top is measure 45°. Find the height of the church.

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

1) In the above figure, chord PQ and chord RS interesect each other at point

T. If $\angle STQ = 58°$ and $\angle PSR = 24°$, then complete the following activity to verify.



$\angle STQ = \frac{1}{2}\left[m(arc\,PR) + m(arc\,SQ)\right]$

In ΔPTS,

$\angle SPQ = \angle STQ - \square$

$\ldots\left[\because Exterior\ angle\ theorem\right]$

$\therefore \angle STQ = 34°$

$\therefore m(arc\,QS) = 2\times\square = 68°$ ...$\square$

Similarly, $m(arc\,PR) = 2\angle PSR = \square$

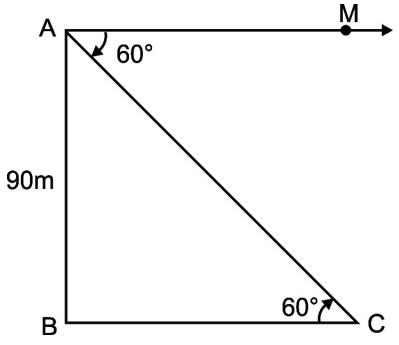
$\therefore \frac{1}{2}\left[m(arc\,QS) + m(arc\,PR)\right] = \frac{1}{2}\times\square = 58°$ ..(i)

But $\angle STQ = 58°$ ....(ii) (given)

$\therefore \frac{1}{2}\left[m(arc\,PR) + m(arc\,QS)\right] = \square$

$\ldots\left[From\,(i)\,and\,(ii)\right]$

2) From the top of a lighthouse, an observer looking at a ship makes an angle of depression of 60^0. If the height of the lighthouse is 90 m then find how far is the ship from the lighthouse. $\left(\sqrt{3} = 1.73\right)$



Let AB be the light house.
The ship is at C and observer is at A.
$\angle MAC$ is the angle of depression.

$\angle MAC = \angle ACB = \square$ .....*Alternate angle*

$AB = \square\ m.$

From the figure, $\tan 60° = \square$

$\sqrt{3} = \frac{90}{BC}$

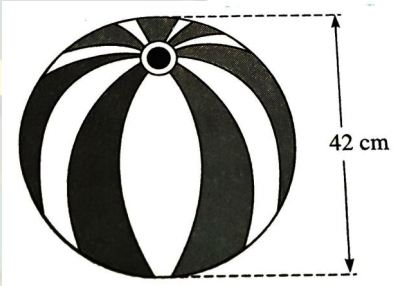
$BC = \frac{90}{\sqrt{3}} = \square\ \frac{90\sqrt{3}}{3} = \square$

$\therefore BC = 30\times 1.73$

$\therefore$ The ship is at a distance of 51.90m from the light house.

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

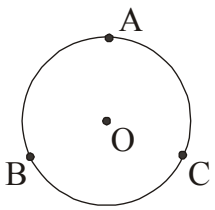
1) Find the surface area and the volume of a beach ball shown in the figure.



2) Determine whether the given points are collinear.
A (0,2), B (1,-0.5),C (2,-3)

3) In an isosceles triangle, length of the congruent sides is 13 cm and its base is 10 cm. Find the distance between the vertex opposite the base and the centroid.

4) A, B, C are any points on the circle with center 'O'



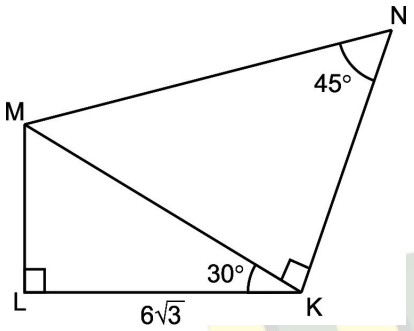
i) Write the names of all arcs formed due to these points.

ii) If m (arc BC) = 110^0 and m (arc AB) = 125^0 find measures of all remaining arcs.

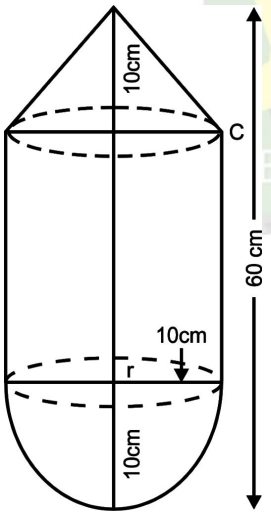
Q.4 Solve the following questions. (Any two) (8)

1) Show that A(4, -1), B(6, 0), C(7, -2) and D(5, -3) are vertices of a square.

2) **In the figure, If $LK = 6\sqrt{3}$, find MK, ML, KN, MN, and the perimeter of ($\square MNKL$)**



3) A toy is a combination of a cylinder, a hemisphere and a cone, each with radius 10 cm. Height of the conical part is 10 cm and the total height is 60 cm. Find the total surface area of the toy. ($\sqrt{2} = 1.41$)



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

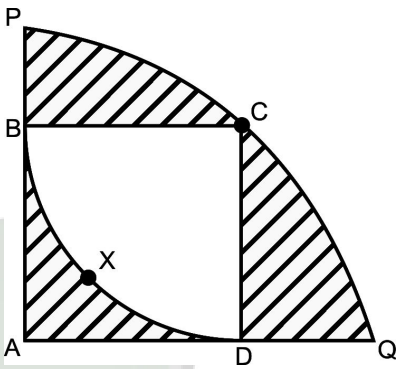
1) AB is a chord of a circle with centre O. AOC is diameter of circle, AT is a tangent at A. Write answers to the following questions:

(i) Draw the figure using the given information.

(ii) Find the measures of $\angle CAT$ and $\angle ABC$ with reasons.

(iii) Whether $\angle CAT$ and $\angle ABC$ are congruent? Justify your answer.

2) In the figure, square ABCD is inscribed in the sector A-PCQ. The radius of sector C-BXD is 20 cm. Find the area of shaded region.



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B.KUMAR'S ACADEMY

Sub : Math-II **Max Marks : 40**

Class : X (State Board) **Pre. Question Paper - 02** **Time : 2 hours**

General Instructions :

Read the following instructions carefully and follow them:

1. All questions are compulsory.**2.** Use of a calculator is not allowed. **3.** The numbers to the right of the questions indicate Full marks. **4.** In case of MCQs [Q. No. 1 (A)) only the first attempt will be evaluated and will be given credit. **5.** For every MCQ, the correct alternatives (A), (B), (C) or (D) with sub-question number is to be written as an answer. **6.** Draw proper figures for answers wherever necessary. **7.** The marks of construction should be clear. Do not erase them. **8.** Diagram is essential for writting the proof of the theorem.

Q.1 A) Solve Multiple Choice questions. **[4]**

1) The sides of a rectangular plot are 15m and 8m, then the length of its diagonal is

a) 15 m b) 23 m
c) 21 m d) 17 m

2) The radius of the base of right cone is 7 cm and height is 24 cm then find its slant height.

a) 23 cm b) 26 cm
c) 31 cm d) 25 cm

3) The maximum number of tangents that can be drawn to a circle from a point out side it is.....

a) 2 b) 1
c) one and only one
d) 0

4) $\angle ACB$ is inscribed in arc ACB of a circle with centre O. If $\angle ACB = 65°$, find m(arc ACB).

a) 65° b) 130°
c) 295° d) 230°

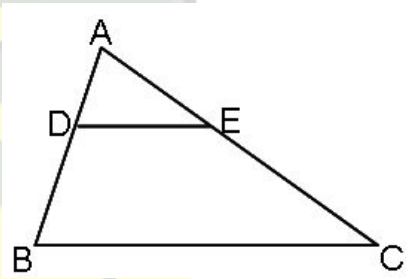
B) Solve the following questions. **[4]**

1) Draw seg AB of length 4.5 cm and draw its perpendicular bisector.

2) Find the total surface area of a cylinder if the radius of its base is 5 cm and height is 40 cm.

3) Radius of a circle is 21 cm. If length of arc of that sector is 55 cm, find the area of the sector.

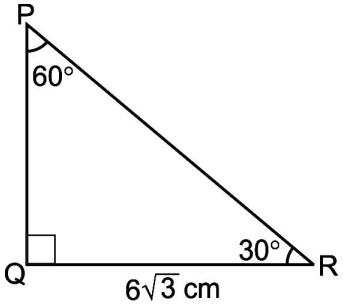
4)



In $\Delta ABC, DE \parallel BC$. If DB = 5.4 cm, AD = 1.8 cm. EC = 7.2 cm then find AE.

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

1) From the information given in the figure, find PR and PQ.



A-1, Ground Floor, Green Park Building Shastri Nagar, near Indian Overseas Bank, Vasai West, Vasai-Virar, Maharashtra 401202 **+91 9619619937, 0250-2334511**

$In\ \Delta PQR, \angle Q = 90°, \angle P = 60°, and\ \angle R = 30°.$

By the theorem of 30° - 60° - 90°

$QR = \_\_\_\_ PR$

$\ldots(\text{Side opposite to } 60°)$

$\therefore 6\sqrt{3} = \frac{\sqrt{3}}{2} PR$

$\therefore PR = 6\sqrt{3} \times \frac{2}{\sqrt{3}}$

$\therefore PR = \square \ldots(1)$

$PQ = \frac{1}{2}\square$

$\ldots(\text{Side opposite to } 30°)$

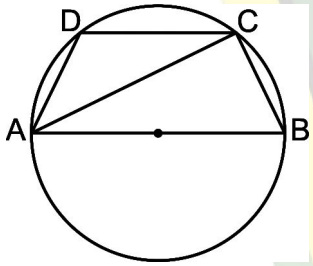
$\therefore PQ = \frac{1}{2} \times 12\,cm$

$\ldots(From\ (1))$

$\therefore PQ = \square$

PR = 12 cm; PQ = 6 cm

2)



In the figure,

$\square ABCD$ is a cyclic quadrilateral. Seg AB is a diameter. If $\angle ADC = 120°$, complete the following activity to find measure of $\angle BAC$.

$\square ABCD$ is a cyclic quadrilateral

$\therefore \angle ADC + \angle ABC = 180°$

$\therefore 120° + \angle ABC = 180°$

$\therefore \angle ABC = \square$

$But\ \angle ACB = \square$

...angle in semicircle

$In\ \Delta ABC,$

$\angle BAC + \angle ACB + \angle ABC = 180°$

$\therefore \angle BAC + 90° + 60° = 180°$

$\therefore \angle BAC + \square = 180°$

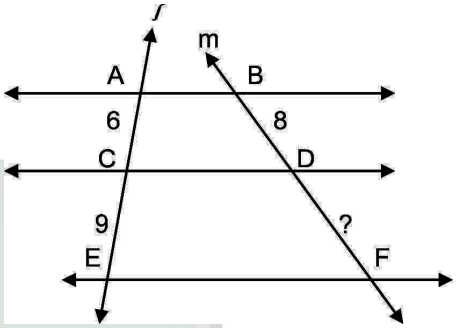
$\therefore \angle BAC = 180° - 150°$

$\therefore \angle BAC = \square$

...angle in semicircle

3) In the figure, line AB || line CD || line EF, line l and line m are its transversals. If AC = 6, CE =9, BD = 8 then complete the following activity to find DF. Activity :

Line AB || line CD || line EF and lines l and m are the transversals.



$\therefore \frac{\square}{\square} = \frac{BD}{DF}$

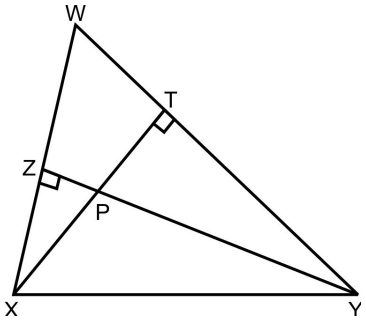
[Property of three parallel lines and their transversals]

$\therefore \frac{6}{9} = \frac{\square}{\square}$

$\therefore DF = \square$

B) Solve the following questions. (Any four) [8]

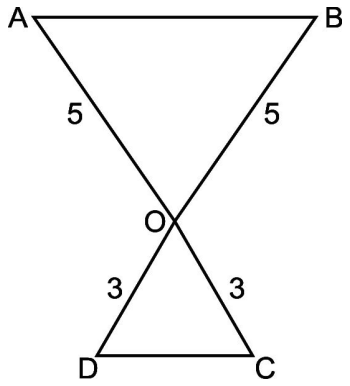
1) In altitudes YZ and XT of Δ WXY intersect at P. Prove that,



i. $\square WZPT$ is cyclic.

ii. Points X, Z, T, Y are concyclic.

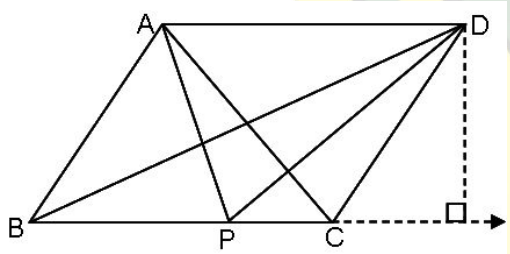
2) In the following figure, indicate whether the triangle are similar or not. Give reason in support of your answer.



3) Construct ΔLMN, such that LM = 6.2 cm, MN = 4.9 cm, LN = 5.6 cm.

4) What is the distance between two parallel tangents of a circle having radius 4.5 cm? Justify your answer.

5) $\square ABCD$ is a parallelogram. P is any point on side BC. Find two pairs of triangles with equal areas.



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

1) The radius of a circle is 3.5 cm and area of the sector is 3.85 cm^2. Find the length of the corresponding arc and the measure of arc.

Area of sector = $\square$

$$\therefore 3.85 = \frac{3.5}{2} \times 1$$

$$\therefore 1 = \frac{3.85}{3.5} \times 2$$

$$\therefore \frac{11 \times 2}{10} = 1$$

$$\therefore 1 = \square$$

Also, length of arc = $\square$

$$\therefore \frac{\theta}{360} \times 2\pi r = 2.2$$

$$\therefore \frac{\theta}{360} \times 2 \times \frac{22}{7} \times 3.5 = 2.2$$

$$\therefore \theta = \square$$

$$\therefore \theta = \frac{22 \times 7 \times 360}{2 \times 22 \times 35} = \frac{360}{10} = \square$$

$\therefore$ **The length of the arc is $\square$ and the measure of the arc is**

2) Find the ratio in which the line segment joining the points A (3, 8) and $B(-9,3)$ is divided by the Y- axis.

$Let, A \equiv (3,8) \equiv (x_1, y_1)$,

$B \equiv (-9,3) \equiv (x_2, y_2)$

$Let, P(x, y)$ divides seg AB in the ratio m:n.

$\therefore$ By section formula,

$x = \square$

$$= \frac{m(-9) + n(3)}{m + n}$$

$x = \square$

As point P lies on Y axis, its x coordinate is $\square$.

$$\therefore 0 = \frac{-9m + 3n}{m + n}$$

$\therefore 0 = \square$

$\therefore 9m = 3n$

$$\therefore \frac{m}{n} = \square$$

$\therefore$ Point P divides seg AB in the ratio $\square$

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

1) The area of a sector of a circle of 6cm radius is 15π sq.cm find the measure of the arc and length of the arc corresponding

to the sector.

2) Prove the following

$\sec^6 x - \tan^6 x = 1 + 3\sec^2 x \times \tan^2 x$

3) A triangle ABC with sides AB = 6 cm, BC = 12 cm and AC = 8 cm is enlarged to ΔPQR such that its largest side is 18 cm. Find the ratio and hence find the lengths of the remaining sides of ΔPQR.

4) ΔABC is an equilateral triangle. Point P is on base BC such that

$PC = \frac{1}{3}BC$, if AB = 6 cm

find AP.

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

1) Prove that

$(1+\tan\theta)^2 + (1+\cot\theta)^2 = (\sec\theta + \operatorname{cosec}\theta)^2$

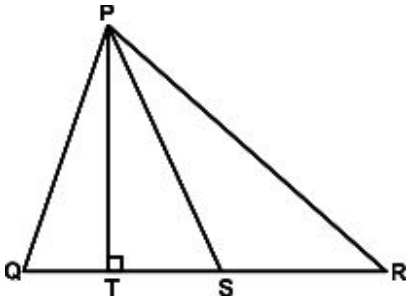
2) Show that the $\square PQRS$ formed by P(2, 1), Q(-1, 3), R(-5, -3), and S(-2, -5) is a rectangle.

3) In the figure, seg PS is the median of ΔPQR and $PT \perp QR$.

Prove that,

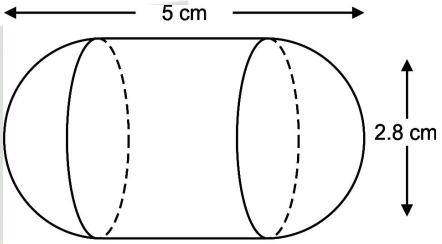
i. $PR^2 = PS^2 + QR \times ST + \left(\frac{QR}{2}\right)^2$

ii. $PQ^2 = PS^2 - QR \times ST + \left(\frac{QR}{2}\right)^2$



Q.5 Solve the following questions. (Any One) [3]

1) A gulab jamun contains sugar syrup upto about 30% of its volume. Find approximately how much syrup be found in 45 gulab jamuns, each shaped like a cylinder with two hemispherical ends with length 5 cm and diameter 2.8 cm. What mathematical concept is used in the above problem ?



Gulab jamun

2) Draw a triangle ABC with side BC = 6 cm, B = $\angle 45°$ and A = $\angle 100°$, then construct a triangle whose sides are $\frac{4}{7}$ times the corresponding sides of ΔABC.

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B.KUMAR'S ACADEMY

Sub : Math-II **Max Marks : 40**

Class : X (State Board) **Pre. Question Paper - 03** **Time : 2 hours**

General Instructions :

Read the following instructions carefully and follow them:

1. All questions are compulsory.**2.** Use of a calculator is not allowed. **3.** The numbers to the right of the questions indicate Full marks. **4.** In case of MCQs [Q. No. 1 (A)) only the first attempt will be evaluated and will be given credit. **5.** For every MCQ, the correct alternatives (A), (B), (C) or (D) with sub-question number is to be written as an answer. **6.** Draw proper figures for answers wherever necessary. **7.** The marks of construction should be clear. Do not erase them. **8.** Diagram is essential for writting the proof of the theorem.

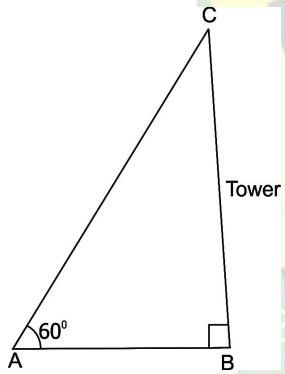
Q.1 A) Solve Multiple choice questions. **[4]**

1) Out of the day given below which date constitutes a phythesgoren triple?

a) 15/8/17 b) 16/8/16

c) 3/5/17 d) 4/9/15

2)



In the given figure, if the of elevation is 60^0 and the distance $AB = 10\sqrt{3}\,m$, then the height of the tower is

a) $20\sqrt{3}\,cm$ b) 10 m

c) 30 m d) $30\sqrt{3}\,m$

3) Two circles intersect each other such that each circle passes through the centre of the other. If the distance between their centres is 12, what is the radius of each circle ?

a) 6 cm b) 12 cm

c) 24 cm d) can't say

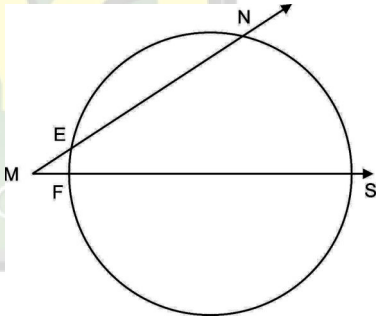
4) $\Delta ABC \sim \Delta AQR, \frac{AB}{AQ} = \frac{7}{2}$ then which of the following option is true.

a) A-Q-B b) A-B-Q

c) A-C-B d) A-R-B

B) Solve the following questions. **[4]**

1)



In the adjoining figure, m(arc NS) = 125°, m(arc EF) = 37°, find the measure of $\angle NMS$.

2 In ΔPQR, seg RS bisects $\angle P$. If PR = 15, RQ = 20, PS = 12 then find SQ.

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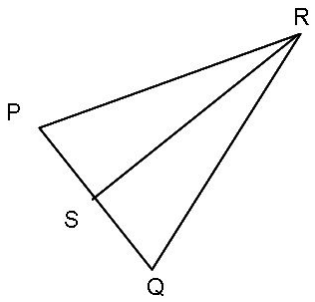
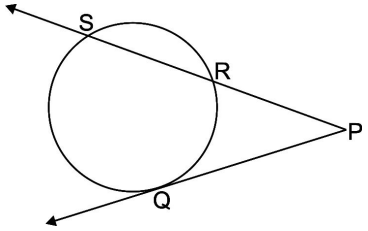


3) What is the area of a sector whose arc length and radius are 22cm and 7cm respectively?

4) In the figure Q is the contact point. If PQ = 12, PR = 8, then PS = ?



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

1) Prove the following :

$$\sec\theta+\tan\theta=\frac{\cos\theta}{1-\sin\theta}$$

$LHS:\sec\theta+\tan\theta$

$$=\frac{1}{\cos\theta}+\frac{\sin\theta}{\cos\theta}$$

$$\ldots\left[\sec\theta=\frac{1}{\cos\theta}\ \tan\theta=\frac{\sin\theta}{\cos\theta}\right]$$

$$=\frac{\square}{\square}$$

$$=\frac{1+\sin\theta}{\cos\theta}\times\frac{\square}{\square}$$

$$=\frac{1-\sin^2\theta}{\cos\theta(1-\sin\theta)}$$

$$\ldots\left[\text{using } (a+b)(a-b)=\square\right]$$

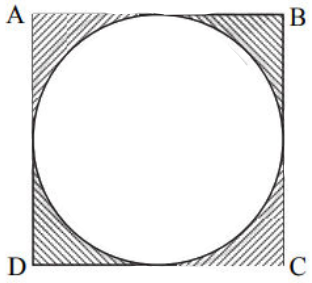
$$=\frac{\cos^2\theta}{\cos\theta(1-\sin\theta)}$$

$$\ldots\left(\sin^2\theta+\cos^2\theta=1\right)$$

$$=\square$$

$\therefore$ LHS=RHS

2)



In the figure given above $\square$ ABCD is a square and circle is inscribed it. All side of square touch the circle. If AB = 14 cm find the area of sheded region.

Solution: Area of square = ($\square$)^2....formula

$= 14^2$

$= \square$ cm^2

Area of circle = ($\square$)....formula

$$=\frac{22}{7}\times7\times7$$

$= 154$ cm^2

area of shaded portion = area of square - atrea of circle

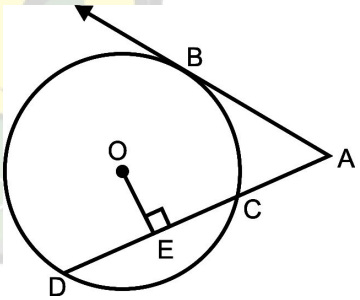
=196 - 154

$= \square$ cm^2

3) In figure, O is the centre of the circle and B is a point of contact.

$Seg\ OE\perp seg\ AD, AB=12,$

$AC=8, find\ (1)\ AD\ (2)\ DC\ (3)\ DE.$



$AB^2=\square\times AD$

...{By property of tangent secant theorem}

$$\square^2=8\times AD$$

$$\therefore AD=\frac{144}{8}$$

AD=18 units, AC=8 units

AD=AC+CD ...{A-C-D}

$18 = 8 + CD$

$\therefore CD = \square\ units$

CD is chord of the circle

$ED \cong EC$

... {Perpendicular drawn from the centre to the chord bisects the chord}

$\therefore ED = EC = \frac{CD}{2} = \frac{10}{2} = 5$ units

DE= $\square$ units

B) Solve the following questions. (Any four) [8]

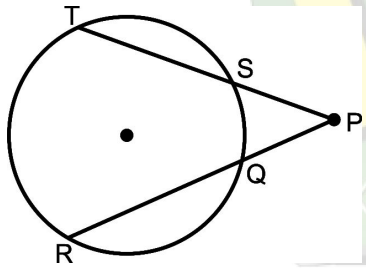
1) Draw a circle of radius 2.7 cm. Draw a tangent to the circle at any point on it.

2) If A (3,5), B (7,9) and point Q divides seg AB in the ratio 2:3 then find co-ordinates of point Q.

3) If $\sin\theta = \cos\theta$, then what will be the measure of angle θ?

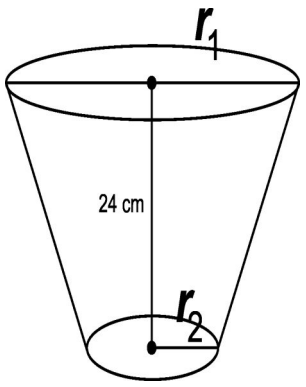
4) Find the diagonal of a square whose side is 10 cm.

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



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

1) The circumferences of circular faces of a frustum are 132 cm and 88 cm and its height is 24 cm. To find the curved surface area of the frustum complete the following activity. $\left(\pi \frac{22}{7}\right)$



Circumference$_1$ $= 2\pi r_1 = 132$

$= r_1 = \frac{132}{2\pi} = \square = \square$

$= \square$

$= \square = \square$

Circumference$_2$ $= 2\pi r_2 = 88$

$= r_2 = \frac{88}{2\pi} = \frac{88 \times 7}{2 \times 22}$

$= 14\,cm$

Slant height (I) $= \sqrt{h^2 + (l_1 - l_2)^2}$

$= \sqrt{24^2 + (\square - \square)^2}$

$= \sqrt{625}$

$= 25\,cm$

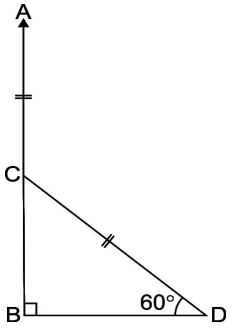
Curved surface area of frustum

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

$= \pi \times \square \times 25$

$= \square\ sq.cm.$

2) A storm broke a tree and the treetop rested on ground 20 m away from the base of the tree, making an angle of 60° with the ground. Find the height of the tree.



AB = Height of the tree
Tree is broken at C
AC = CD ... (1)

$\angle CDB = 60°$

$BD = 20\,m$

In right angled ΔCBD,

$\tan 60° = \square$

$\sqrt{3} = \frac{CB}{20}$

$CB = 20\sqrt{3}$

$\sin 60° = \frac{CB}{CD}$

$\frac{\sqrt{3}}{2} = \frac{20\sqrt{3}}{CD}$

$CD = \square$

$CD = 40\,m$

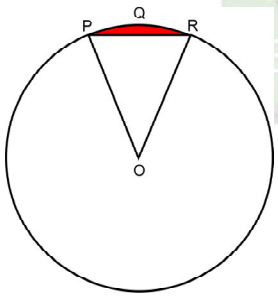
$\therefore AC = CD = 40m \ldots (\text{From}(1))$

$AB = \square$

$\therefore$ Height of the tree = $\square$

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

1) In the figure, O is the centre of the circle. m(arc PQR) = 60° OP = 10 cm. Find the area of the shaded region. $(\pi = 3.14, \sqrt{3} = 1.73)$



2) $\Delta ABC \sim \Delta LMN$ in ΔABC,

$AB = 5.5\,cm$,

$BC = 6\,cm$ & $CA = 4.5cm$

Construct ΔABC & ΔLMN

Such that $\frac{BC}{MN} = \frac{5}{4}$

3) In ΔABC seg AP is a median. If BC = 18, $AB^2 + AC^2 = 260$. Find AP.

4) $\Delta LMN \sim \Delta PQR, 9 \times A(\Delta PQR)$

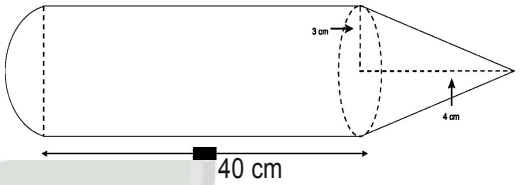
$= 16 \times A(\Delta LMN)$.

If QR =20 then find MN.

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

1) If $\frac{1}{\text{Sin}^2\theta} - \frac{1}{\text{Cos}^2\theta} - \frac{1}{\tan^2\theta} - \frac{1}{\cot^2\theta} - \frac{1}{\sec^2\theta} - \frac{1}{\text{cosec}^2\theta} = -3$ than find the value of θ.

2)



In the figure, a toy made from a hemisphere, a cylinder and a cone is shown. Find the total area of the toy.

3) 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.

Q.5 Solve the following questions. (Any One) [3]

1) The line x - 6y + 11 = 0 bisects the segment joining the points (8, -1) and (0, k), then find the value of k.

2) An architecture has model of building. Length of building is 1 m then length of model is 0.75 m then find length and height of model building whose actual length is 22.5 m and height is 10 m.

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B.KUMAR'S ACADEMY

Sub : Math-II **Max Marks : 40**

Class : X (State Board) **Pre. Question Paper - 04** **Time : 2 hours**

General Instructions :

Read the following instructions carefully and follow them:

1. All questions are compulsory.**2.** Use of a calculator is not allowed. **3.** The numbers to the right of the questions indicate Full marks. **4.** In case of MCQs [Q. No. 1 (A)) only the first attempt will be evaluated and will be given credit. **5.** For every MCQ, the correct alternatives (A), (B), (C) or (D) with sub-question number is to be written as an answer. **6.** Draw proper figures for answers wherever necessary. **7.** The marks of construction should be clear. Do not erase them. **8.** Diagram is essential for writting the proof of the theorem.

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

1) Find the ratio in which the line joining the points (6, 4) and (1, – 7) is divided by X-axis.

a. 4:7 b. 2:7

c. 1:3 d. 6:7

2) How many common tangents can be drawn to two circles, touching each other externally?

a. One b. Two

c. Three d. Four

3) Two circles of radii 5.5 cm and 3.3 cm respectively touch each other. What is the distance between their centers?

a. 4.4 cm b. 8.8 cm

c. 2.2 cm

d. 8.8 or 2.2 cm

4) If the areas of two similar triangles are in the ratio 4 : 9, then their corresponding sides are in the ratio.

a. 9 : 4 b. 3 : 2

c. 2 : 3 d. 16 : 81

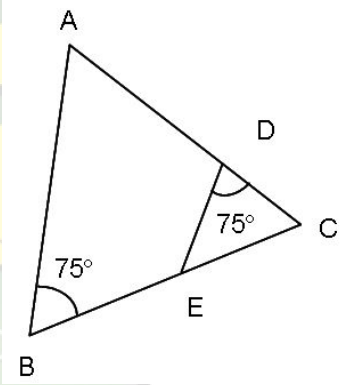
B) Solve the following questions. **(4)**

1) Find the value of $\sin\theta \times \operatorname{cosec}\theta$

2) Find the slopes of the lines passing through the given points.

T(0, – 3) , S(0, 4)

3) In figure, $\angle ABC = 75°, \angle EDC = 75°$ state which two triangles are similar and by which test? Also write the similarity of these two triangles by a proper one to one correspondence.



4) What is the point of concurrence of the altitudes of a triangle known as?

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

1) Identify, with reason, which of the following are Pythagorean triplets. (11, 60, 61)

$61^2 = \square$

and $11^2 + 60^2 = \square + 3600$

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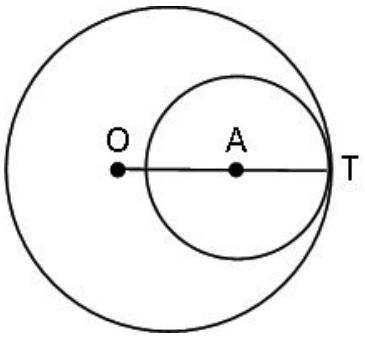
$= \square$

$\therefore \quad 61^2 \quad = 11^2 + 60^2$

$\therefore$ (11, 60, 61) is a $\square$ triplets.

2) Two circles having radii 3.5 cm and 4.8 cm touch each other internally. Find the distance between their centres.



Let two circles with centres O and A touch each other internally at point T

$\therefore$ O-A-T

... [If two circles are touching circles then the common point lies on the line joining their centres]

$\therefore$ OT = ____ + AT ... [O - A - T]

$\therefore$ OA = ___ ... [given]

OT = 4.8 cm, AT = 3.5 cm.

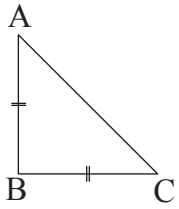
$\therefore$ OA = ___

OA = ___cm

$\therefore$ The distance between the centres is ___cm

3) The hypotenuse of an isosceles right angled ΔABC is $8\sqrt{2}$ cm. Find BC.

ΔABC is an isoceles right angled triangle, by pythagoras theorem.



$AC^2 = \square + BC^2$

but AB = $\square$ ($\because$ given)

$AC^2 = BC^2 + BC^2$

$AC^2 = 2\square$

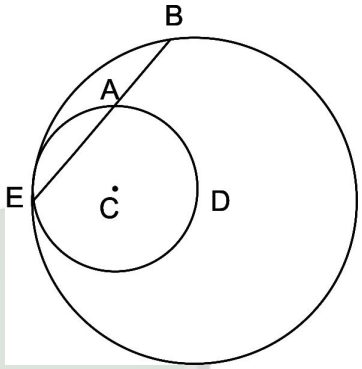
$\left(8\sqrt{2}\right)^2 = 2BC^2$

$64 \times 2 = 2BC^2$

$BC^2 = 64$, BC = $\square$ cm

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

1)



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,

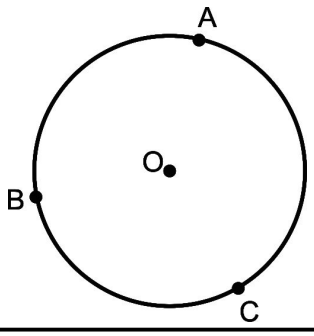
seg EA $\cong$ seg AB.

2) Draw seg PQ = 7cm. Divide it in the ratio 3:2.

3) A, B, C are any points on the circle with centre O.

(i) Write the names of all arcs formed due to these points.

(ii) If m arc (BC) = 110° and m arc (AB) = 125°, find measures of all remaining arcs.



4) Find the centroid of the triangles whose vertices are given below.

$(-7,6),(2,-2),(8,5)$

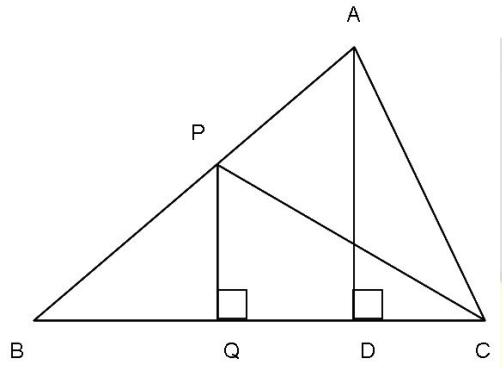
5) In adjoining figure $PQ \perp BC$, $AD \perp BC$ then find following ratios.

(i) $\frac{A(\Delta PQB)}{A(\Delta PBC)}$

(ii) $\frac{A(\Delta PBC)}{A(\Delta ABC)}$

(iii) $\frac{A(\Delta ABC)}{A(\Delta ADC)}$

(iv) $\frac{A(\Delta ADC)}{A(\Delta PQC)}$



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

1) Complete the following activity to draw tangents to the circle.

Draw a circle with radius 3.3 cm and centre O. Draw chord PQ of length 6.6 cm.

(a) Draw ray OP and ray OQ.

(b) Draw a line perpendicular to the ray OP from P.

(c) Draw a line perpendicular to the ray OQ from Q.

2) In $\Delta PQR\ PD \perp QR$, such that D lies on QR. If PQ = a, PR =b, QD=c and DR = d, Prove that (a + b) (a - b) = (c + d) (c - d).

Now in right ΔPQD

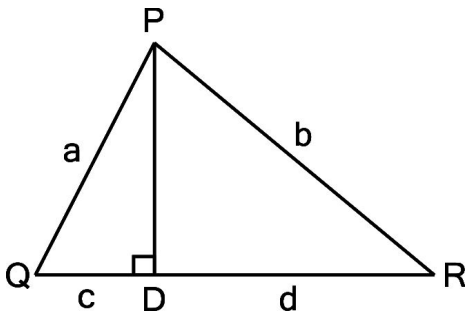
$PQ^2 = \square$

$PD^2 = PQ^2 - QD^2$

$= \square$ ...(1)

Similarly in right ΔPDR

$PR^2 = \square$



$PD^2 = PR^2 - DR^2$

$= \square$

From (1) and (2)

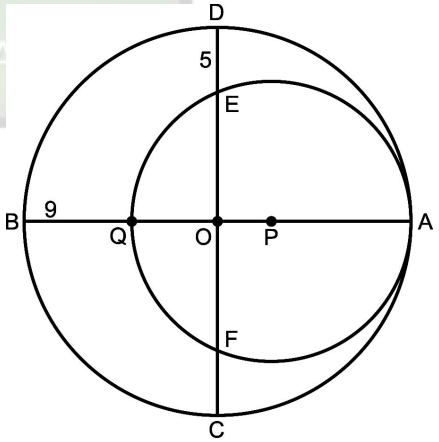
$a^2 - c^2 = b^2 - d^2$

$\square = c^2 - d^2$

$(a+b)(a-b) = \square$

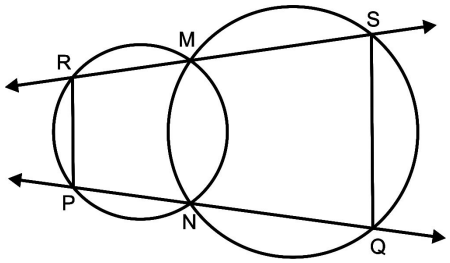
B) Solve the following questions. (Any two) (6)

1) In the figure, two circles with centres O and P are touching internally at point A. If BQ = 9, DE = 5, find the radii of the circles.



2) In two circles intersect at points M and N. Secants drawn through M and N

intersect the circles at points R, S and P, Q respectively. Prove that : seg SQ || seg RP.



3) Prove that, '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.'

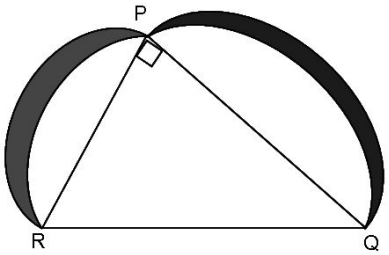
4) If $\tan\theta = 1$, then find the value of $\frac{\sin\theta + \cos\theta}{\sec\theta + \text{cosec}\,\theta}$ where is θ, an acute angle.

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

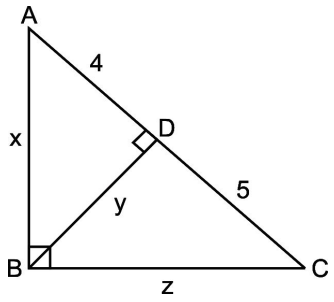
1) In the following examples, can the segment joining the given points form a triangle? If triangle is formed, state the type of the triangle considering sides of the triangle.

$A(\sqrt{2},\sqrt{2}), B(-\sqrt{2},-\sqrt{2}), C(-\sqrt{6},\sqrt{6})$

2) In the adjoining figure, PR = 6 units and PQ = 8 units. Semicircles are drawn taking sides PR, RQ and PQ as diameters as shown in the figure. Find out the area of the shaded portion. $(\pi = 3.14)$

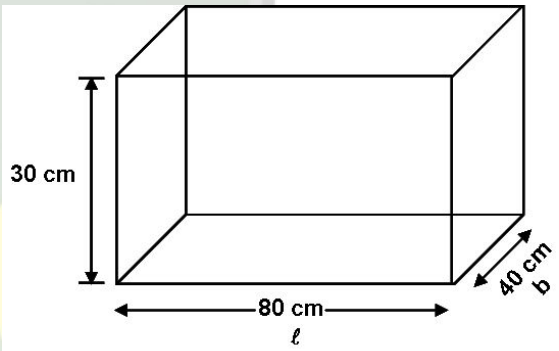


3) In the given figure, an altitude is drawn to the hypotenuse.
The lengths of different segment are marked in the figure, determine the value of x, y, z



Q.5 Solve the following questions. (Any One) (3)

1) Niyam wants to decorate a fish tank which is in the form of a cuboid with external measures 80 cm×40 cm×30 cm.
1. Find the area of the paper needed to cover the fish tank from base, side faces, and back face.
2. What mathematical concept is used in the above problem?



2) Prove that

$$\frac{\tan A}{\left(1+\tan^2 A\right)^2} + \frac{\cot A}{\left(1+\cot^2 A\right)^2} = \sin A \cos A$$

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B.KUMAR'S ACADEMY

Sub : Math-II **Max Marks : 40**

Class : X (State Board) **Pre. Question Paper - 05** **Time : 2 hours**

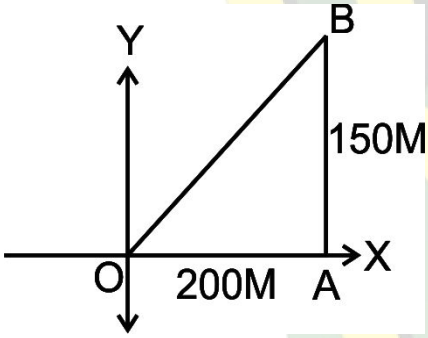
General Instructions :

Read the following instructions carefully and follow them:

1. All questions are compulsory.**2.** Use of a calculator is not allowed. **3.** The numbers to the right of the questions indicate Full marks. **4.** In case of MCQs [Q. No. 1 (A)) only the first attempt will be evaluated and will be given credit. **5.** For every MCQ, the correct alternatives (A), (B), (C) or (D) with sub-question number is to be written as an answer. **6.** Draw proper figures for answers wherever necessary. **7.** The marks of construction should be clear. Do not erase them. **8.** Diagram is essential for writting the proof of the theorem.

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

1)

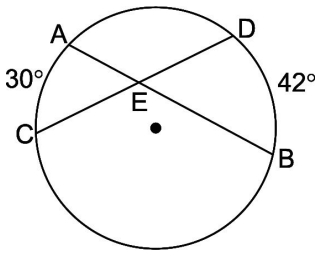


A girl walks 200 m towards East and then she walks 150 m towards North. The distance of the girl starting point is

a. 350 m b. 250 m

c. 300 m d. 225 m

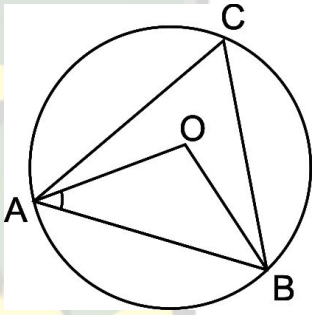
2) **From the information given in the figure, find the measure of** $\angle AEC$



a. 42° b. 30°

c. 36° d. 72°

3)



In the given figure. O is the center of the circle. If $\angle OAB = 40°$, then $\angle ACB$ is equal to

a. 50^0 b. 40^0

c. 60^0 d. 70^0

4) $\Delta LMN \sim \Delta HIJ$ and $\frac{LM}{HI} = \frac{2}{3}$

then .....

(a) ΔLMN is a smaller triangle.

(b) ΔHIJ is a smaller triangle.

(c) both triangles are congruent.

(d) can't say

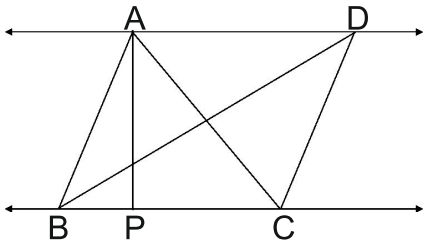
B) Solve the following questions. (4)

1) Diagonal of a square is 20 cm. Find

the length and perimeter of the square.

2) If measure of an arc of a circle is $160°$ and its length is 44cm, find the circumference of the circle.

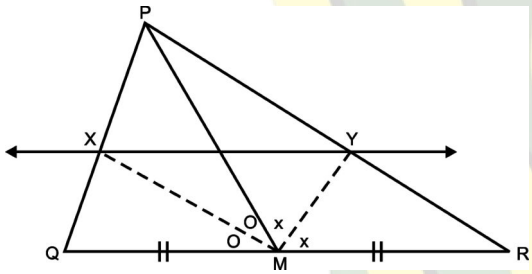
3) In adjoining figure, $AP \perp BC$, AD || BC, then find $A(\Delta ABC) : A(\Delta BCD)$



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

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

1)



In ΔPQR seg PM is a median. Angle bisectors of $\angle PMQ$ and $\angle PMR$ intersect side PQ and side PR in points X and Y respectively. Prove that XY || QR. Complete the proof by filling in the boxes.

In $In \Delta PMQ$, , ray MX is bisector of $\angle PMQ$

$\therefore$ $\square = \square$

... (I) Theorem of angle bisector.

In ΔPMR, ray MY is bisector of $\angle PMR$.

$\therefore$ $\square = \square$

... (II) Theorem of angle bisector.

But

$$\frac{MP}{MQ} = \frac{MP}{MR}$$

... M is the midpoint QR, hence MQ = MR

$$\therefore \frac{PX}{XQ} = \frac{PY}{YR}$$

$\therefore XY \parallel QR$

... converse of basic proportionality theorem.

2) In the following figure 'O' is the centre of the circle.

$\angle AOB = 110°, m(arc\ AC) = 45°.$

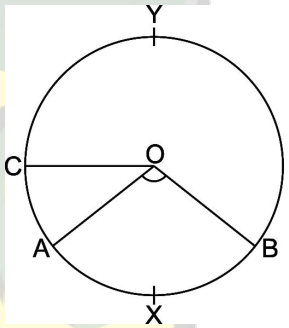
Use the information and fill in the boxes with proper numbers.

i. m (arc AXB) = $\square$

ii. m (arc CAB) = $\square$

iii. $\angle COB = \square$

iv. m (arc AYB) = $\square$



3) A washing tub in the shape of a frustum of a cone has height 21cm. The radii of the circular top and bottom are 20cm and 15cm respectively. What is the capacity of the tub? $\left(\pi = \frac{22}{7}\right)$

Volume of washing tub $= \frac{1}{3} \times \pi h(\square)$

$= \frac{1}{3} \times \frac{22}{7} \times 21(20^2 + 15^2 + 20 \times 15)$

$= 22(\square)$

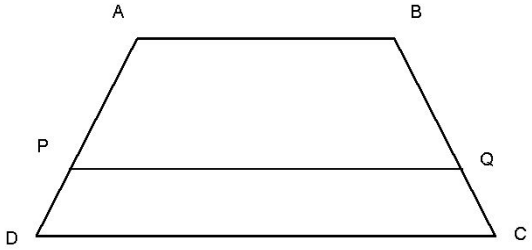
$= 22 \times \square$

Volume of washing tub =20350 cm^3

$\therefore$ Capacity of washing tub is $\square$ cm^3

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

1) In trapezium ABCD, side AB || side PQ || side DC, AP = 15, PD = 12, QC = 14, find BQ.



2) Draw any circle. Take any point A on it and construct tangent at A without using the centre of the circle.

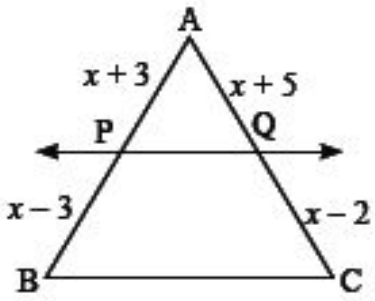
3) If A (3,5), B (7,9) and point Q divides seg AB in the ratio 2:3 then find co-ordinates of point Q.

4) Prove that, any rectangle is a cyclic quadrilateral.

5) If the length of an arc of sector of a circle is 20 cm and if its radius is 7 cm, find the area of the sector.

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

1)



From Fig., seg PQ || side BC, AP = x + 3, PB = x – 3, AQ = x + 5, QC = x – 2, then complete the activity to find the value of x.

In $\Delta PQB, PQ \| \text{side BC}$

$\therefore \frac{AP}{PB} = \frac{AQ}{QC}$

(Basic proportionality theorem)

$\therefore \frac{x+3}{x-3} = \frac{\square}{\square}$

$\therefore (x+3)\square = (x+5)(x-3)$

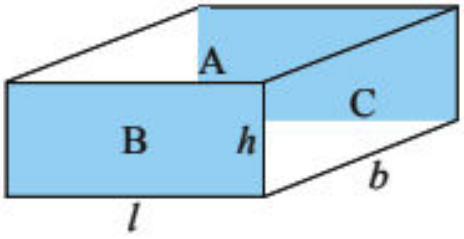
$x^2 + x - \square = x^2 + 2x - 15$

$x - 2x = -15 + 6$

$-x = \square$

$x = \square$

2) The three faces A, B, C of a cuboid in the given figure have surface areas of 600, 450 and 300 cm^2 respectively. Complete the following activity to find the volume of the cuboid.



Surface area of face A = l × b = 600 cm^2

Surface area of face B = l × h = $\square$ cm^2

Surface area of face C = $\square$ =300cm

Multiplying above equations

lb× $\square$ ×bh = 600 × 450 × 300

$\therefore$ $(lbh)^2$ =81,000,000

Taking square root,

$\square$ = 9000 cm^3

Volume of cuboid = $\square$

$\therefore$ Volume of cuboid = $\square$ cm^2

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

1) Draw a circle with radius 3.3 cm. Draw a chord PQ of length 6.6 cm. Draw tangents to the circle at points P and Q. Write your observation about the tangents.

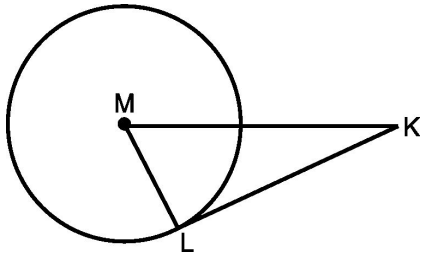
2) Prove $\sec^6 x - \tan^6 x = 1 + 3\sec^2 x \times \tan^2 x$

3) In the figure M is the centre of the circle and seg KL is a tangent segment.

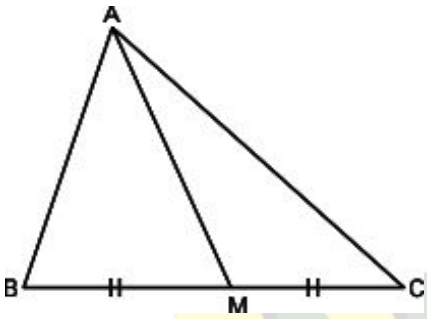
If MK = 12, KL = $6\sqrt{3}$ then find -

(1) Radius of the circle.

(2) Measures of $\angle K$ and $\angle M$.



4) In ΔABC, point M is the midpoint of side BC. If, $AB^2 + AC^2 = 290\ cm^2$, AM = 8, find BC.



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

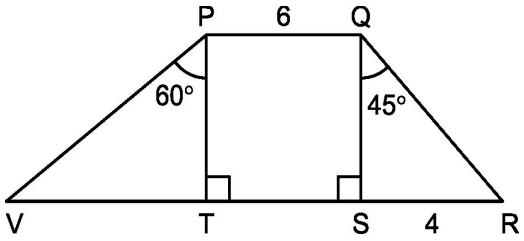
1) Prove the following.

(sec A - cosec A) (1 + tan A + cot A)

= tan A sec A - cot A cosec A

2) Find the coordinates of the circumcentre of a triangle whose vertices are (-3,1), (0,-2) and (1,3)

3) In the figure, $\square PQRV$ is a trapezium in which seg PQ || seg VR SR = 4 and PQ = 6 Find : VR



Q.5 Solve the following questions. (Any One) (3)

1) $\Delta AMT \sim \Delta AHE$ .In ΔAMT, AM = 6.3cm ,

$\angle TAM = 50^0$, AT = 5.6cm $\frac{AM}{AH} = \frac{7}{5}$

construct ΔAHE .

2) If $5\sin\theta - 12\cos\theta = 0$, find the values of $\sec\theta$ and $\text{cosec}\,\theta$.

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