MATHS

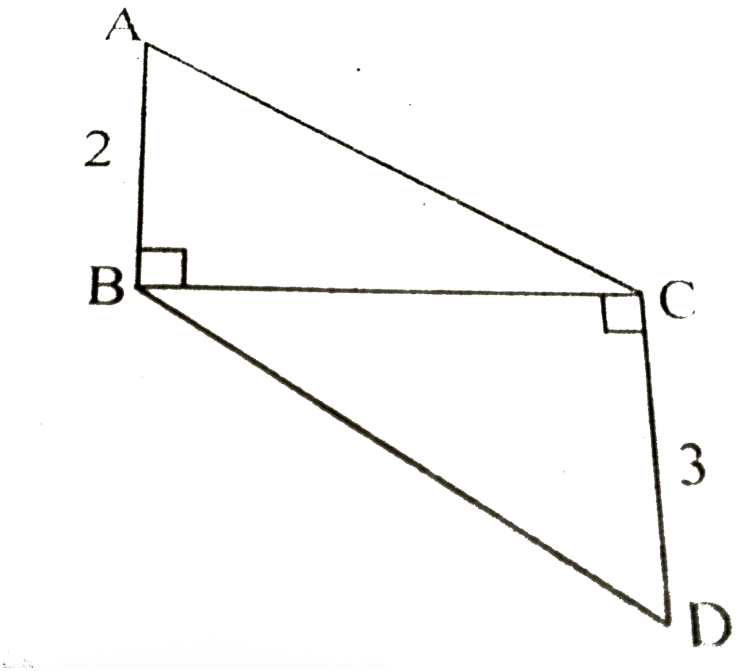
BOOKS - GURUKUL BOOKS & PACKAGING MATHS (HINGLISH)

GEOMETRY MARCH 2015

Solve Any Five Sub Questions

1. In the following figure, seg $AB \perp$ seg BC, seg DC $\perp$ seg BC.

If AB = 2 and DC = 3, find $\frac{A(\Delta ABC)}{A(\Delta DCB)}$.



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2. Find the slope and y-intercept of the line$y = -2x + 3$.

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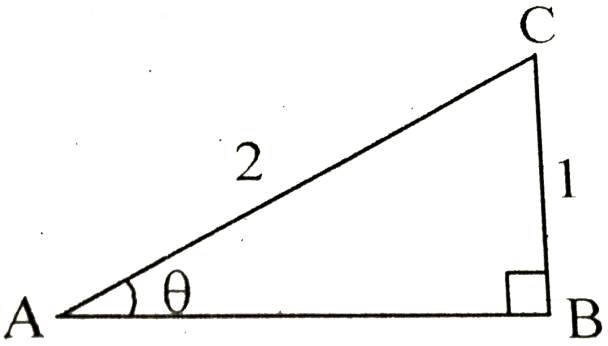
3. In the following figure, in ΔABC, $BC = 1$, $AC = 2$, $\angle B = 90^\circ$.. Find the value of $\sin\theta$.



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

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5. The volume of a cube is $1000cm^3$. Find the side of a cube.

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6. If two circles with radii 5 cm and 3 cm respectively touch internally, find the distance between their centres.

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7. $\Delta DEF \sim \Delta MNK$. If $DE = 2, MN = 5,$ then find the value of $\frac{A(\Delta DEF)}{A(\Delta MNK)}$

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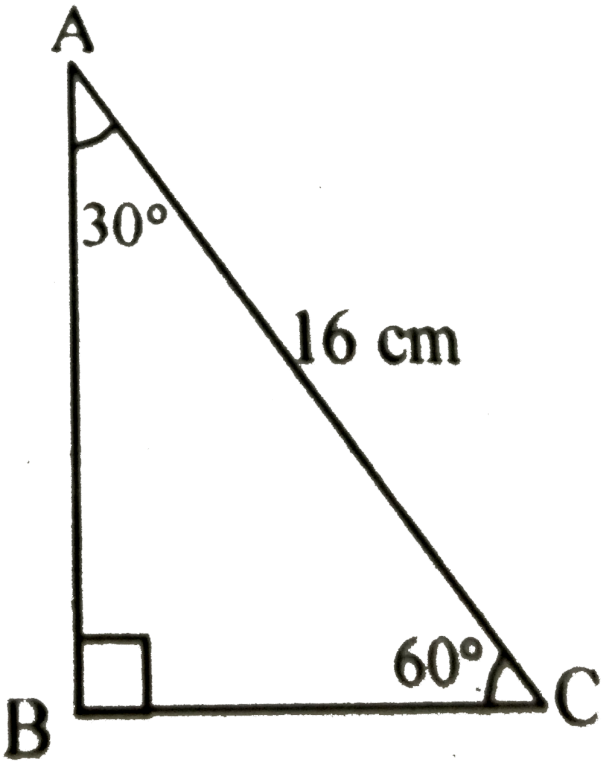
8. In the following figure, in $\Delta ABC, \angle B = 90^\circ, \angle C = 60^\circ, \angle A = 30^\circ, AC = 16cm.$ Find

BC.



A. $32cm$

B. $24cm$

C. $16cm$

D. $8cm$

Answer: D

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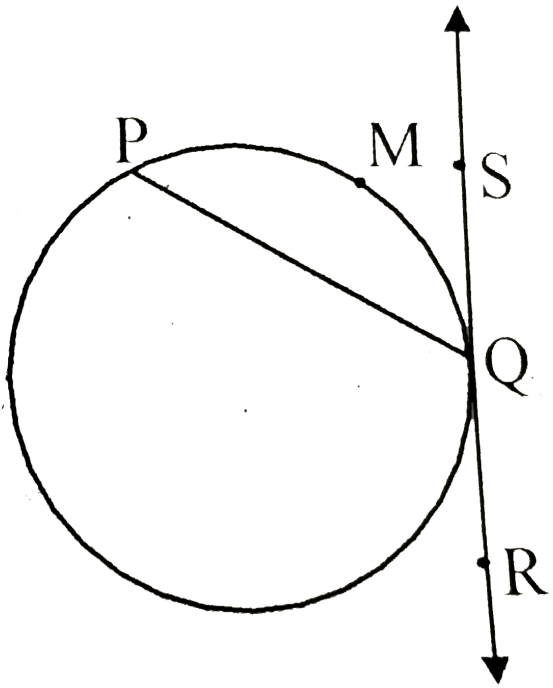
9. In the following figure, m(arc PMQ) $= 110^\circ$, find $\angle PQS$.



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10. If the angle $\theta = -30^\circ$, find the value of $\cos\theta$.

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11. Find the slope of the line with inclination 60°.

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12. Using Euler's formula, find V if E = 10, F = 6.

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Solve Any Four Sub Questions

1. If $\sin\theta = \frac{5}{13}$, where θ is an acute angle, find the value of $\cos\theta$.

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2. Draw $\angle ABC = 115^\circ$, construct its bisector

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3. Find the slope of the line passing through the points $C(3, 5)$ and $D(-2, -3)$.

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4. Find the area of the sector whose arc length and radius are 10 cm and 5 cm respectively.

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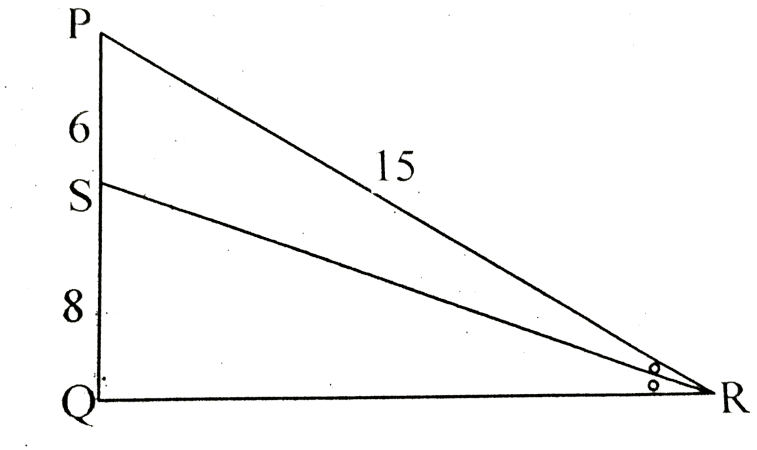
5. In the following figure, in ΔPQR, seg RS is the bisector of $\angle PQR$, $PS = 6$, $SQ = 8$, $PR = 15$.

Find QR.



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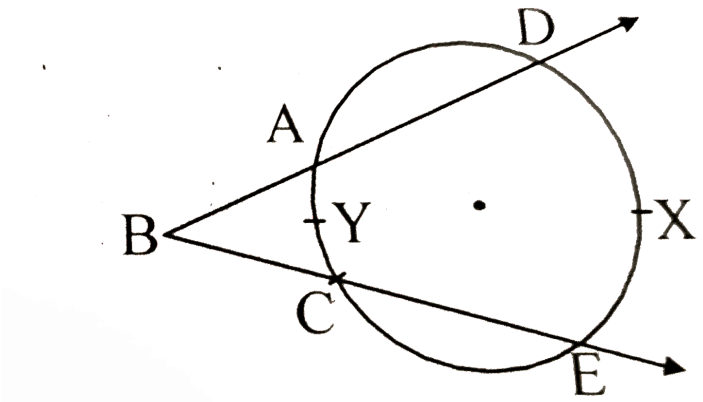
6. In the following figure, if m(arc DXE) $= 100^\circ$ and m(arc AYC) $= 40^\circ$, find $\angle DBE$.



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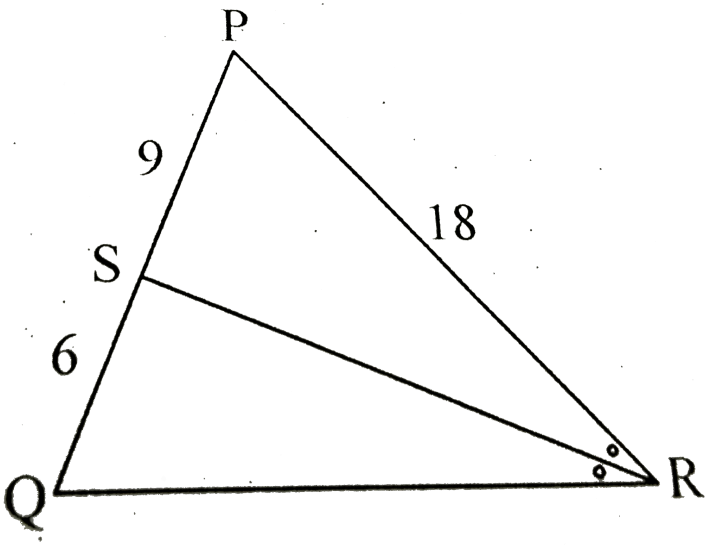
7. In the following figure, in ΔPRQ, seg RS is the bisector of $\angle PRQ$. If $PS = 9$, $SQ = 6$, $PR = 18$, find QR.



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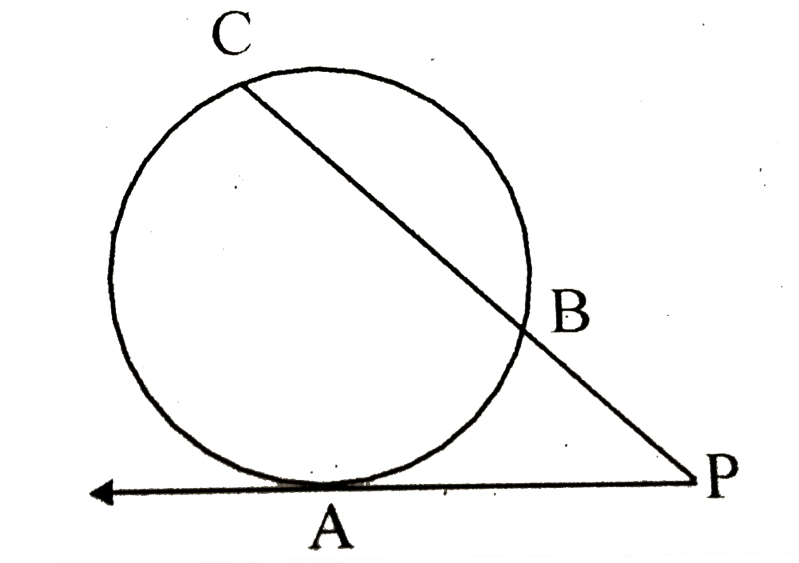
8. In the following figure, a tangent segment PA touching a circle in A and a secant PBC are shown. If AP = 12, BP = 9, find BC.



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9. For the angle in standard position if the initial arm rotates 130° in anticlockwise direction, then state the quadrant in which terminal arm lies. (Draw the Figure and write the answer.)

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10. Find the area of sector whose arc length and radius are 16 cm and 9 cm respectively.

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11. Find the surface area of a sphere of radius 1.4 cm. $\left(\pi - \frac{22}{7}\right)$

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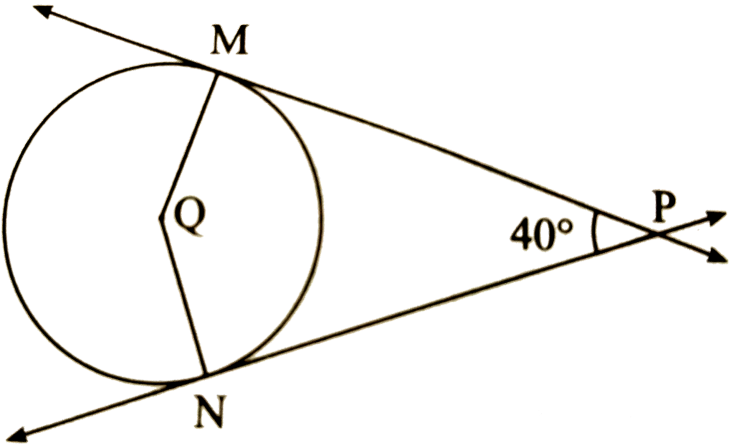
Solve Any Three Sub Questions

1. In the figrure, Q is the centre of the circle and PM and PN are tangent segments to the circle. If $\angle MPN = 40^\circ$, find $\angle MQN$



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2. The ratio of the areas of two triangles with common base is 4:3. Height of the larger triangle is 6 cm, then find the corresponding height of the smaller triangle.

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3. Two buildings are in front of each other on either side of a road of width 10 metres. From the top of the first building which is 30 metres high, the angle of elevation to the top of the second is 45°. What is the height of the second building?

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4. Find the volume and surface area of a sphere of radius 4.2 cm. $\left(\pi = \frac{22}{7}\right)$

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5. Adjacent sides of a parallelogram are 11 cm and 17 cm. If the length of one of its diagonal is 26 cm, find the length of the other.

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6. If $\sec\alpha = \frac{2}{\sqrt{3}}$, the find the value of $\frac{1-\text{cosec}\ \alpha}{1+\text{cosec}\ \alpha}$, where α is in IV quadrant.

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7. Write the equation of the line passing through the pair of points (2, 3) and (4, 7) in the form of $y = mx + c$.

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Solve Any Two Sub Questions

1. The sum of either pair of opposite angles of a cyclic quadrilateral is 180^0 OR The opposite angles of a cyclic

quadrilateral are supplementary.

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2. Prove that $\sin^6\theta + \cos^6\theta = 1 - 3\sin^2\theta.\cos^2\theta.$

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3. A test tube has diameter 20 mm and height is 15 cm. The lower part is a hemisphere. Find the capacity of the test tube. $(\pi = 3.14)$

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4. Prove the following statement. "The bisector of an angle of a triangle divides the sides opposite to the angle in the ratio of

the remaining sides"

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5. Write down the equation of a line whose slope is $\frac{3}{2}$ and which passes through point P, where P divides the line segment AB joining $A(-2, 6)$ and $B(3, -4)$ in the ratio $2:3$.

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6. Theorem: The length of two tangents drawn from an external point to a circle are equal.

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7. A person standing on the bank of a river observes that the angle of elevation of the top of a tree standing on the opposite bank is 60°. When he moves 40 m away from the bank, he finds the angle of elevation to be 30°. Find the height of the tree and width of the river. $\left(\sqrt{3} = 1.73\right)$

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8. $A(5, 4), B(-3, -2)$ and $C(1, -8)$ are the vertices of a triangle ABC. Find the equations of median AD and line parallel to AC passing through the point B.

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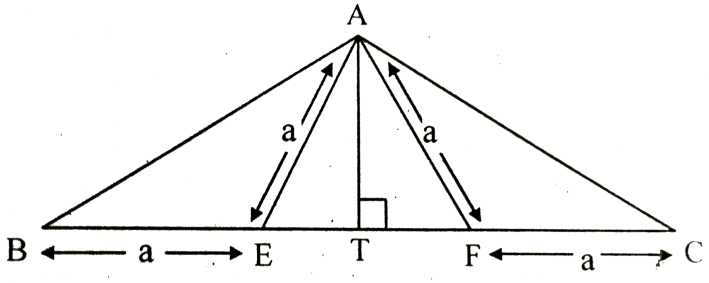
9. In the following figure, $AE = EF = AF = BE = CF = a, AT \perp BC.$ Show that $AB = AC = \sqrt{3} \times a$



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10. In ΔSHR, $SH = 4.5cm, HR = 5.2cm, SR = 5.8cm$ and $\frac{SH}{SV} = \frac{3}{5}$ construct ΔSVU. $\Delta SHR \sim \Delta SVU.$

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11. Water flows at the rate of 15m per minute through a cylindrical pipe, having the diameter 20 mm. How much time will it take to fill a conical vessel of base diameter 40 cm and depth 45 cm?

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