BOARD QUESTION PAPER : MARCH 2015

Time: 2 Hours **Max. Marks: 40**

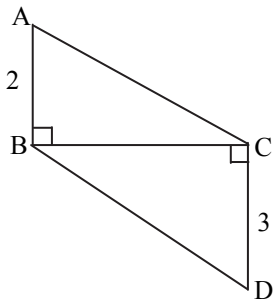
Note:
i. Solve *All* questions. Draw diagrams wherever necessary.
ii. Use of calculator is not allowed.
iii. Figures to the right indicate full marks.
iv. Marks of constructions should be distinct. They should not be rubbed off.
v. Diagram is essential for writing the proof of the theorem.

Q.P. SET CODE

A

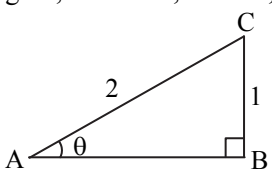
1. Solve any five sub-questions: **[5]**

i. In the following figure seg AB $\perp$ seg BC, seg DC $\perp$ seg BC. If AB = 2 and DC = 3, find $\frac{A(\Delta ABC)}{A(\Delta DCB)}$.



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

iii. In the following figure, in ΔABC, BC = 1, AC = 2, $\angle B = 90°$. Find the value of sin θ.



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

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

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

2. Solve any four sub-questions: **[8]**

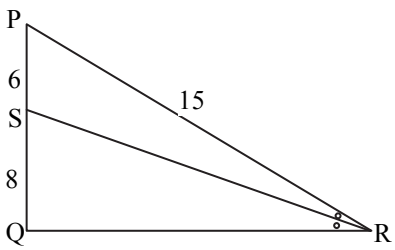
i. If $\sin\theta = \frac{5}{13}$, where θ is an acute angle, find the value of cos θ.

ii. Draw $\angle ABC$ of measure 115° and bisect it.

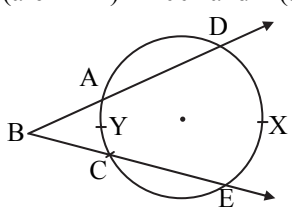
iii. Find the slope of the line passing through the points C(3, 5) and D(–2, –3).

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

v. In the following figure, in a ΔPQR, seg RS is the bisector of $\angle PRQ$, PS = 6, SQ = 8, PR = 15. Find QR.

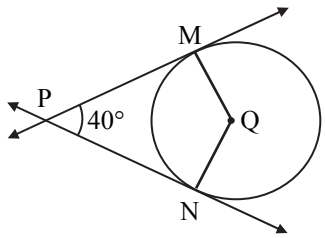


vi. In the following figure, if m(arc DXE) = 100° and m(arc AYC) = 40°, find $\angle DBE$.



3. Solve any three sub-questions: **[9]**

i. In the following figure, Q is the centre of a circle and PM, PN are tangent segments to the circle. If ∠MPN = 40°, find ∠MQN.



ii. Draw the tangents to the circle from the point L with radius 2.8 cm. Point, 'L' is at a distance 7 cm from the centre 'M'.

iii. The ratio of the areas of two triangles with the common base is 6:5. Height of the larger triangle is 9 cm, then find the corresponding height of the smaller triangle.

iv. 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?

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

4. Solve any two sub-questions: **[8]**

i. Prove that "the opposite angles of a cyclic quadrilateral are supplementary".

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

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

5. Solve any two sub-questions: **[10]**

i. Prove that the angle bisector of a triangle divides the side opposite to the angle in the ratio of the remaining sides.

ii. 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.

iii. $\Delta RST \sim \Delta UAY$. In ΔRST, RS = 6 cm, ∠S = 50°, ST = 7.5 cm. The corresponding sides of ΔRST and ΔUAY are in the ratio 5 : 4. Construct ΔUAY.

BOARD QUESTION PAPER : JULY 2015

Time: 2 Hours **Max. Marks: 40**

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iii. Figures to the right indicate full marks.
iv. Marks of constructions should be distinct. They should not be rubbed off.
v. Diagram is essential for writing the proof of the theorem.

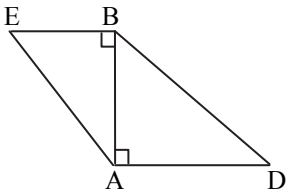
Q.P. SET CODE
A

1. Solve any five sub-questions: **[5]**

i. In the figure drawn alongside,

seg BE ⊥ seg AB and seg BA ⊥ seg AD.

If BE = 6 and AD = 9, find $\frac{A(\Delta ABE)}{A(\Delta BAD)}$.



ii. Find the diagonal of a square whose side is 16 cm.

iii. If two circles with radii 8 and 3 respectively touch internally, then find the distance between their centres.

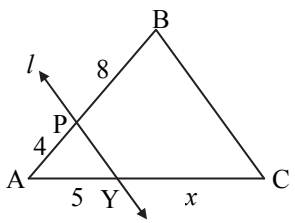
iv. If $\cos\theta = \frac{\sqrt{3}}{2}$, then find the value of acute angle θ.

v. If the slope of a line is 2 and *y* intercept is 5, then write the equation of that line.

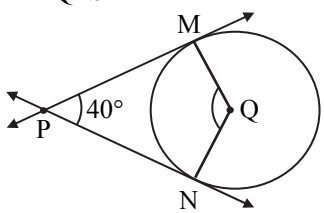
vi. Find the total surface area of a cube with side 9 cm.

2. Solve any four sub-questions: **[8]**

i. In the given figure, line *l* || side BC, AP = 4, PB = 8, AY = 5 and YC = *x*. Find *x*.



ii. In the figure alongside, Q is the centre of a circle and PM, PN are tangent segments to the circle. If ∠MPN = 40°, find ∠MQN.



iii. Draw a tangent at any point R on a circle of radius 3.5 cm and centre P.

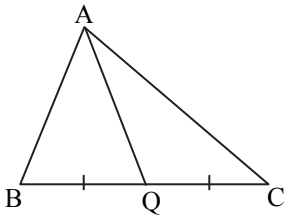
iv. Draw the figure for an angle in standard position. If the intial arm rotates 220° in the clockwise direction, then state the quadrant in which the terminal arm lies.

v. The radius of the base of a right circular cylinder is 3 cm and its height is 7 cm, find the curved surface area.

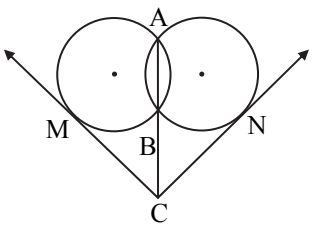
vi. A sector of a circle with radius 10 cm has central angle 72°. Find the area of the sector.
(π = 3.14)

3. Solve any three sub-questions: **[9]**

i. In the given figure,
$AB^2 + AC^2 = 122$, BC = 10. Find the length of the median on side BC.



ii. In the figure, two circles intersect each other in points A and B. Seg AB is the chord of both circles. The point C is the exterior point of both the circles on the line AB. From the point C, tangents have been drawn to the circles touching at M and N. Prove that CM = CN.



iii. Draw the circumcircle of ΔPMT in which PM = 5.4 cm, ∠P = 60°, ∠M = 70°.

iv. Show that: $\sec^2\theta + \text{cosec}^2\theta = \sec^2\theta \cdot \text{cosec}^2\theta$.

v. Find the value of k if (–3, 11), (6, 2) and (k, 4) are collinear points.

4. Solve any two sub-questions: **[8]**

i. Prove that "the opposite angles of a cyclic quadrilateral are supplementary".

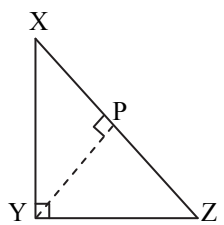
ii. A ship of height 24 m is sighted from a lighthouse. From the top of the lighthouse, the angles of depression to the top of the mast and base of the ship are 30° and 45° respectively. How far is the ship from the lighthouse? $(\sqrt{3} = 1.73)$

iii. In triangle ABC, the coordinates of vertices A, B and C are (4, 7), (–2, 3) and (0, 1) respectively. Find the equations of the medians passing through the vertices A, B and C.

5. Solve any two sub-questions: **[10]**

i. In the figure drawn algonside, ΔXYZ is a right triangle, right angled at Y such that YZ = b and A(ΔXYZ) = a.
If YP ⊥ XZ, then show that

$$YP = \frac{2ab}{\sqrt{b^2 + 4a^2}}$$



ii. ΔABC ~ ΔLMN. In ΔABC, AB = 5.1 cm, ∠B = 55°, ∠C= 65° and $\frac{AC}{LN} = \frac{3}{5}$, then construct ΔLMN.

iii. An ink container of cylindrical shape is filled with ink upto 71%. Ball pen refills of length 12 cm and inner diameter 2 mm are filled upto 84%. If the height and radius of the ink container are 14 cm and 6 cm respectively, find the number of refills that can be filled with this ink.

BOARD QUESTION PAPER : MARCH 2016

Time: 2 Hours **Max. Marks: 40**

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v. Diagram is essential for writing the proof of the theorem.

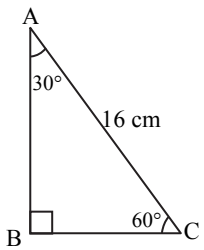
Q.P. SET CODE

C

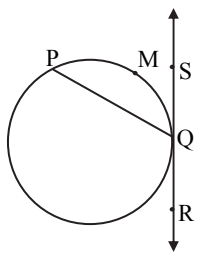
1. Solve any five sub-questions: **[5]**

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

ii. In the following figure, in ΔABC, $\angle B = 90°$, $\angle C = 60°$, $\angle A = 30°$, AC = 16 cm. Find BC.



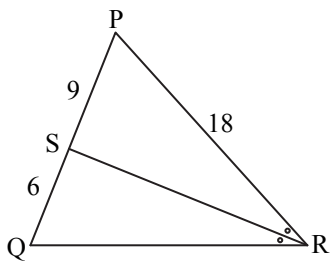
iii. In the following figure, m(arc PMQ) = 110°, find $\angle PQS$.



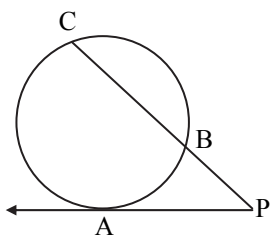
iv. If the angle $\theta = -30°$, find the value of $\cos\theta$.
v. Find the slope of the line with inclination 60°.
vi. Using Euler's formula, find V if E = 10, F = 6.

2. Solve any four sub-questions: **[8]**

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



ii. 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.



iii. Draw an equilateral Δ ABC with side 6.4 cm and construct its circumcircle.

iv. 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.)

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

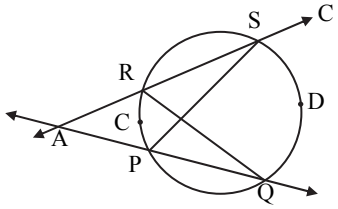
vi. Find the surface area of a sphere of radius 1.4 cm. $\left(\pi = \frac{22}{7}\right)$

3. Solve any three sub-questions: **[9]**

i. 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.

ii. In the following figure, secants containing chords RS and PQ of a circle intersects each other in point A in the exterior of a circle. If m(arc PCR) = 26°, m(arc QDS) = 48°, then find:

a. m ∠ PQR b. m ∠ SPQ c. m ∠ RAQ



iii. Draw a circle of radius 3.5 cm. Take any point K on it. Draw a tangent to the circle at K without using centre of the circle.

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

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

4. Solve any two sub-questions: **[8]**

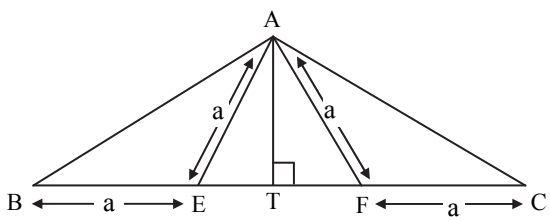
i. Prove that "The length of the two tangent segments to a circle drawn from an external point are equal".

ii. 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. $\left(\sqrt{3} = 1.73\right)$

iii. 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.

5. Solve any two sub-questions: **[10]**

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



ii. Δ SHR ~ Δ SVU. In Δ SHR, SH = 4.5 cm, HR = 5.2 cm, SR = 5.8 cm and $\frac{SH}{SV} = \frac{3}{5}$. Construct Δ SVU.

iii. 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?