

Samagra Shiksha, Kerala
Second Terminal Evaluation 2018 – 19
Mathematics – Class X English Version Questions and Solutions.
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1. a) Write the coordinates of another point on the line passing through the points A (2, 1), B (7,1)
- b) Write the coordinates of a point on the line perpendicular to this line and passing through B (7,1)

Solution:-

Given A(2,1), B(7,1)

(a) Here the given points be parallel to the X-axis so the Y coordinates be equal.

ie., (4,1) or (5,1) or (8,1) (The property of horizontal line)

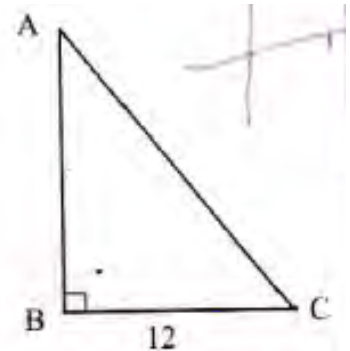
(b) A line , which will perpendicular to a line parallel to the X-axis to be parallel to Y-axis, the X coordinates be equal.

ie., (7,2) or (7,3) or (7,5), .. be the the same points on the vertical line. (The property of vertical line)

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2. In the figure $\angle B = 90^\circ$, $BC = 12$ centimetres, $\tan C = \frac{3}{4}$.

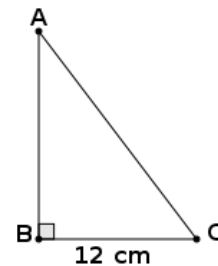
- a) Find the length of AB.
- b) Find $\tan A$



Solution :-

(a) From the right trangle ABC,

$$\tan C = \frac{AB}{BC} = \frac{3}{4}$$



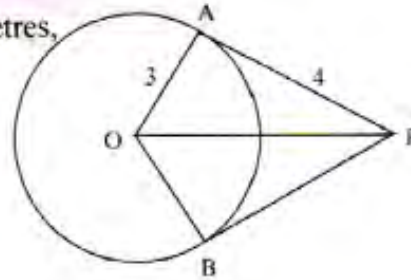
$$= \frac{AB}{12} = \frac{3}{4}, AB = \frac{36}{4} = 9\text{cm.}$$

$$(b) \tan A = \frac{BC}{AS} = \frac{12}{9} = \frac{4}{3}.$$

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3. In the figure PA, PB are tangents, O is the centre of the circle. If the radius of the circle is 3 centimetres, and PA = 4 centimetres

- a) What is the length of PB?
b) Find the length of OP.



Solution :-

Given radius = 3cm. , PA = 4cm. PA and PB are tangents = 4cm.

(a) Length of PB = 4cm (tangents are equal)

(b) In triangle PAO, by Pythagoras,

$$OP = \sqrt{OA^2 + PA^2} = \sqrt{3^2 + 4^2} = \sqrt{25} = 5 \text{ cm.}$$

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4. Volume of a wooden cube is 729 cubic centimetres. A square pyramid of maximum size is carved out from it.

- a) What is the volume of the pyramid?
b) What is the height of the pyramid?

Solution :-

Given, Volume of a wooden cube = 729 cm³. (a² h)

(a) Volume of the pyramid = $\frac{1}{3} a^2 h = \frac{1}{3} \times 729 = 243 \text{ cm}^3$.

(b) Height of the pyramid = Height of the cube

Volume of cube is given = 729

ie., a³ = 729 , a = $3\sqrt[3]{729} = 9 \text{ cm.}$

Hence height = 9cm.

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5. In triangle ABC, AB = 12 centimetres, $\angle A = 30^\circ$, $\angle B = 60^\circ$. Find the area of the triangle.

Solution:-

Given, AB = 12cm, $\angle A = 30^\circ$ and $\angle B = 60^\circ$.

In right triangle ABC,

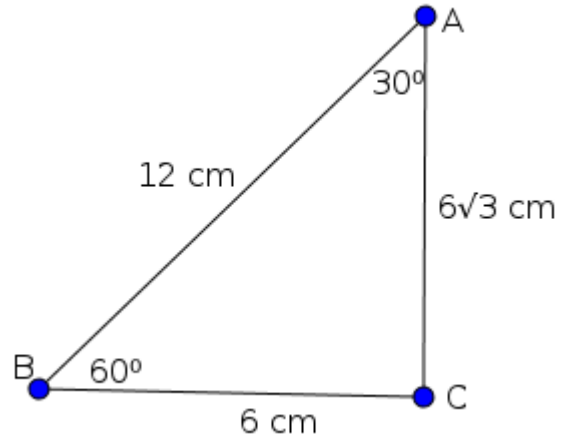
Angles be 30° , 60° , 90° .

ie., $1 : \sqrt{3} : 2$.

From this AC = $6\sqrt{3}$ (h)

Area of the triangle = $\frac{1}{2} \times bh$

$$= \frac{1}{2} \times 6 \times 6\sqrt{3} = 18\sqrt{3} \text{ cm}^2$$



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6. The sides of a rectangle are parallel to the axes. Coordinates of a pair of opposite vertices are (3,5), (7,8).

a) Write the coordinates of other two vertices of the rectangle

b) Calculate the length of its diagonal.

Solution:-

(a) Given, opposite vertices

A(3, 5), C(7,8)

From the figure we can see that,

The coordinates of B(7,5)

The coordinates of D(3,8).

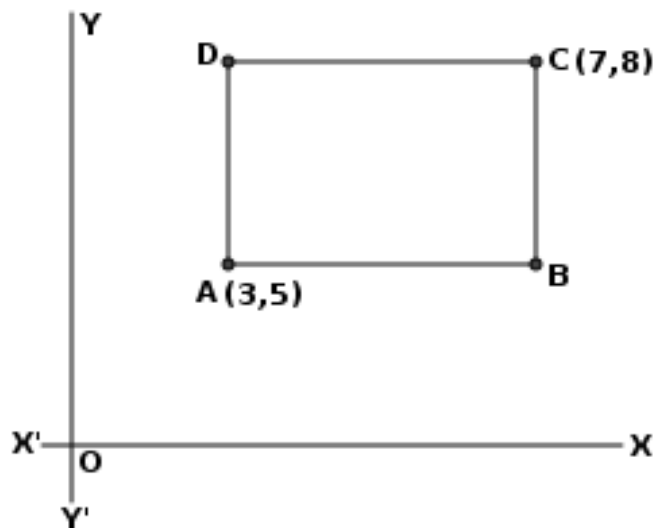
(b) The length of the diagonal

$$= \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$= \sqrt{(7 - 3)^2 + (8 - 5)^2}$$

$$= \sqrt{4^2 + 3^2} = \sqrt{16 + 9}$$

$$= \sqrt{25} = 5 \text{ unit.}$$



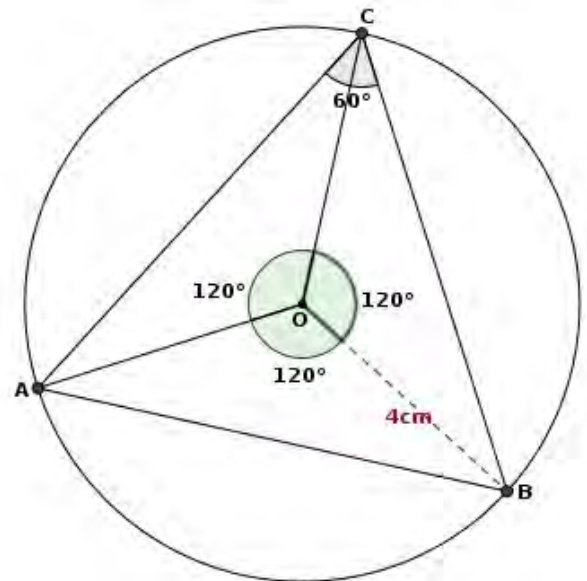
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7/ Circumradius of an equilateral triangle is 4 centimetres. Draw the triangle. Measure its side.

Solution :-

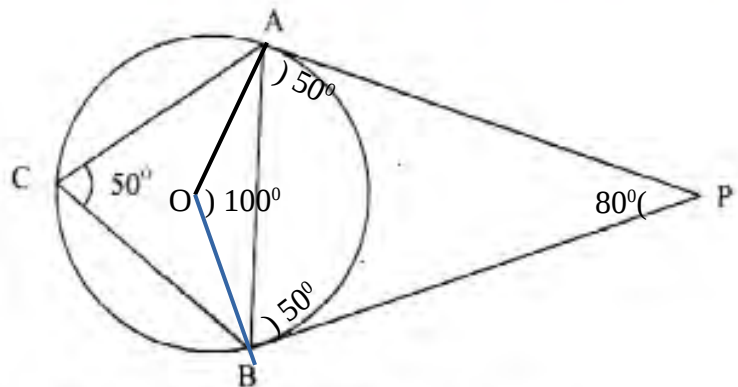
Construction: -

Draw a circle with radius 4cm and centre O. Draw any radius OA . Make an $\angle AOC = 120^\circ$. Then $\angle COB = 120^\circ$. Join A, B and C. Triangle ABC is the required triangle.



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8. In the figure PA and PB are tangents, $\angle C = 50^\circ$
- Write the angle measures of triangle PAB.
 - What is the measure of $\angle P$, if $\angle C = \angle P$?



Solution :-

(a) Given $\angle C = 50^\circ$, PA = PA tangents

$$\angle AOB = 2 \angle C = 2 \times 50 = 100$$

$$\angle BPA = 180 - 100 = 80^\circ .$$

Triangle BPA is an isosceles ,their base angles are equal

$$\text{ie., } \angle A = \angle B = \frac{1}{2}(180 - 80) = 50^\circ .$$

Hence the angle measure of triangle PAB , $\angle P = 80^\circ$, $\angle A = 50^\circ$, $\angle B = 50^\circ$.

(b) In $\angle APB$, $\angle P = 180 - 2 \angle C$

Here if $\angle C = \angle P$

$$\angle P = 180 - 2 \angle P .$$

$$\angle P + 2 \angle P = 180 ; 3 \angle P = 180 ; \angle P = 180/3 = 60.$$

Hence, $\angle P = 60^\circ$.

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9 / a) What is the sum of first 10 terms of the arithmetic sequence 1, 2, 3, ...?

b) Sum of how many terms of this sequence, starting from the first is 300?

Solution :-

(a) Given AP = 1,2,3,..... ; n = 10

$$\text{Sum} = \frac{n(n+1)}{2} = \frac{10(10+1)}{2} = \frac{10 \times 11}{2} = 55.$$

(b) Let the sum of n terms = 300.

$$\text{ie., } \frac{n(n+1)}{2} = 300 \Rightarrow \frac{n^2+n}{2} = 300 \Rightarrow n^2 + n = 300 \times 2$$

$$\Rightarrow n^2 + n - 600 = 0. \text{ be a quadratic form}$$

$$\Rightarrow (n - 24) (n + 25) = 0$$

n = 24 or n = - 25 , - 25 rejected ; Hence n = 24.

Hence the sum of the first 24 be 300.

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10. The base edge of a wooden square pyramid is 10 centimetres and its height is 12 centimetres.

a) What is its slant height?

b) Find the radius and slant height of the cone of maximum size, that can be carved out from this.

Solution:-

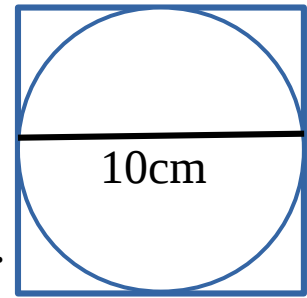
(a) Given, a = 10cm; h = 12cm.

$$l = \sqrt{h^2 + \left(\frac{a}{2}\right)^2} = \sqrt{12^2 + 5^2} = \sqrt{144 + 25} = \sqrt{169} = 13 \text{ cm}$$

(b) Side of the pyramid = Diameter of the cone.

$$\text{ie., Radius} = \frac{10}{2} = 5 \text{ cm.}$$

$$\begin{aligned} \text{Slant height} &= \sqrt{h^2 + r^2} = \sqrt{12^2 + 5^2} \\ &= \sqrt{144 + 25} = \sqrt{159} = 13 \text{ cm.} \end{aligned}$$



OR

Here Slant height of the pyramid be the slant height of the cone.
ie., 13cm.

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11. A cone of maximum size is made with a sector of radius 12 centimetres and central angle 120°

a) Find the slant height and radius of the cone.

b) The ratio between radius and slant height of a cone is 2:5. What is the central angle of the sector used to make this cone?

Solution:-

Given radius = 12cm; centre angle = 120° .

(a) Sector of radius = Slant height of the cone = 12cm.

$$\text{We know that } \frac{r}{l} = \frac{x^\circ}{360} ; \Rightarrow \frac{r}{12} = \frac{120}{360} \Rightarrow 360 r = 120 \times 12$$

$$\Rightarrow r = 4\text{cm.}$$

(b) Given, ratio b/w radius and slant height = 2 : 5.

Centre angle of the sector,

$$\text{We know that } \frac{r}{R} = \frac{x^\circ}{360} \Rightarrow \frac{2}{5} = \frac{x^\circ}{360} \Rightarrow 5 \times x^\circ = 2 \times 360$$

$$x^\circ = \frac{2 \times 360}{5} = 144^\circ.$$

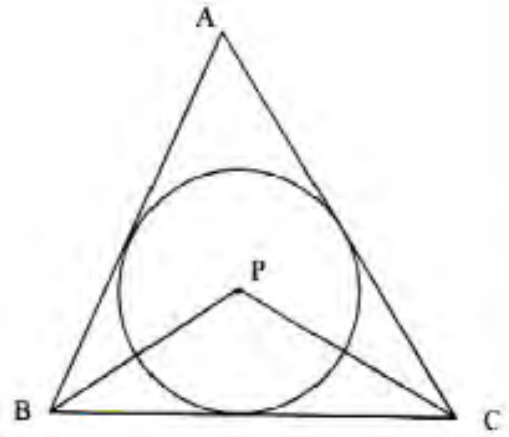
Hence, Centre angle of the sector, = 144° .

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12. a) If the angle measures of a triangle are x, y, z ,

$$\frac{x}{2} + \frac{y}{2} + \frac{z}{2} = \underline{\hspace{2cm}}$$

- b) In the figure, P is the incentre and $\angle A = 80^\circ$.
Find $\angle BPC$.



Solution :-

- (a) Given angle measures of a triangle = x, y, z .

$$\text{Let } \angle A = x^\circ, \angle B = y^\circ, \angle C = z^\circ.$$

$$\text{ie., } \angle A + \angle B + \angle C = x^\circ + y^\circ + z^\circ = 180^\circ.$$

$$\frac{x}{2} + \frac{y}{2} + \frac{z}{2} = \frac{180}{2} = 90^\circ$$

- (b) Given $\angle A = 80^\circ$. We know that, P is the incentre, otherwise the angles bisectors meeting point

$$\text{Therefore } \frac{1}{2} \angle A = \frac{80}{2} = 40^\circ.$$

$$\frac{1}{2} \angle B + \frac{1}{2} \angle C = 90 - 40 = 50^\circ.$$

$$\text{In triangle BPC, } \frac{1}{2} \angle B + \frac{1}{2} \angle C + \angle P + \angle C = 180^\circ.$$

$$\begin{aligned} \angle BPC &= 180 - \frac{1}{2} \angle B + \frac{1}{2} \angle C \\ &= 180 - 50 = 130^\circ. \end{aligned}$$

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13. While writing the equation to construct a rectangle of specified perimeter and area, perimeter was wrongly written as 46 instead of 64. One side of the rectangle was then computed as 20 metres.

- What is the length of the other side?
- What is the area of the rectangle?
- Find the sides of the rectangle in the original problem.

Solution :-

(a) Given perimeter = 46 cm. ie., $2(l + b) = 46$

$$\text{So, } l + b = \frac{46}{2} = 23.$$

Given length = 20 m ; breadth = $23 - 20 = 3\text{m}$

(b) Area = $l \times b = 20 \times 3 = 60\text{m}^2$.

(c) Hence the correct perimeter = 64m ; $2(l + b) = 64$

$$\text{So, } l + b = \frac{64}{2} = 32\text{m} .$$

Let the length be x ; then the breadth = $32 - x$.

$$\text{Area} = l \times b = x(32 - x) = 60 ;$$

$$\Rightarrow 32x - x^2 = 60$$

$$\Rightarrow x^2 - 32x + 60 = 0$$

$$\Rightarrow (x - 30)(x - 2) = 0$$

$$\Rightarrow x - 30 = 0 \text{ or } x - 2 = 0$$

$$x = 30 \text{ or } x = 2.$$

Correct sides of the rectangle = 30m , 2m. Or 2m , 30m.

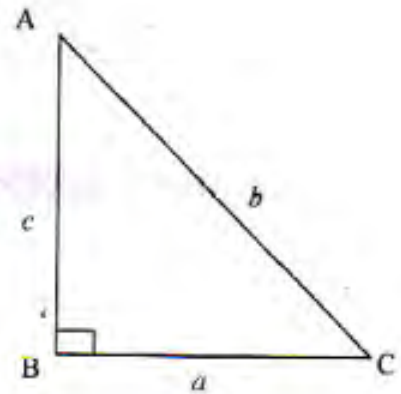
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14. In the figure, $\angle B = 90^\circ$, $AB = c$, $BC = a$, $AC = b$.

a) $\angle A + \angle C =$ _____

b) Prove that $\sin A = \cos C$.

c) If $\sin 24^\circ = \cos x$, find x .



Solution:-

(a) $\angle A + \angle C = 180 - \angle B = 180 - 90 = 90^\circ$. [sum = 180°]

$$\text{(b) LHS } \sin A = \frac{\text{opp side}}{\text{hyp}} = \frac{a}{b}$$

$$\text{RHS } \cos C = \frac{\text{adj side}}{\text{hyp}} = \frac{a}{b}$$

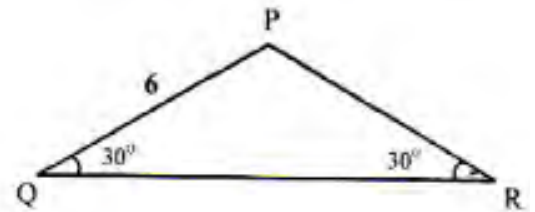
Here LHS = RHS. Hence proved.

(c) $\sin 24 = \cos(90 - 24) = \cos 66$. ; Hence $x = 66^\circ$.

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15. In the figure, $\angle Q = \angle R = 30^\circ$, $PQ = 6$ centimetres.

- a) What is the length of PR?
- b) Find the length of QR.
- c) Draw triangle PQR.



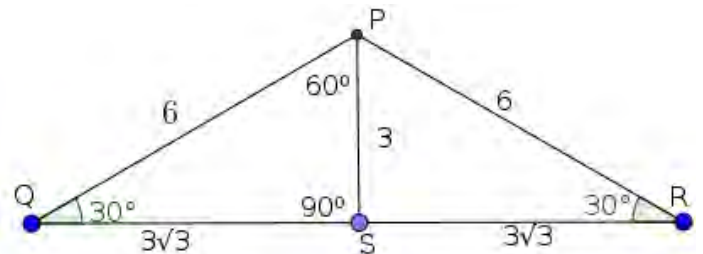
Solution:-

(a) Length of PR = 6cm. [PQR is an isosceles triangle]

(b) Draw PS perpendicular to QR. In triangle PSQ $30^\circ, 60^\circ, 90^\circ$.

$$1 : \sqrt{3} : 2.$$

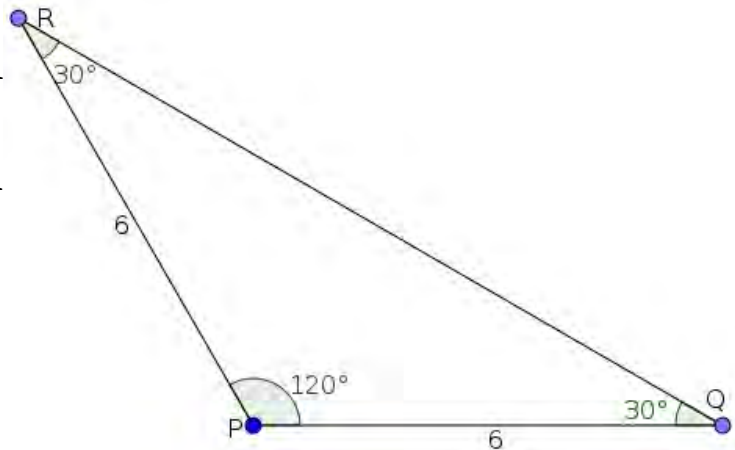
So, $PS = 3, QS = 3\sqrt{3}, PQ = 6$.



Hence, $QR = QS + SR = 3\sqrt{3} + 3\sqrt{3} = 6\sqrt{3}$

(c)

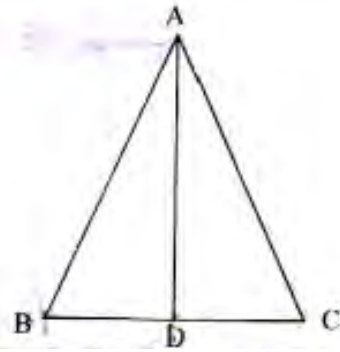
Draw $PQ = 6$ cm, Make angle $P = 120^\circ$ and mark $PR = 6$ cm along it. Join RQ. Triangle QPR is the required triangle.



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16. ABC is an equilateral triangle. Coordinates of B are (1,4) and that of D are (4,4). D is the midpoint of BC.

- a) What are the coordinates of C?
 b) Write the coordinates of A.



Solution:-

Given B(1,4) Midpoint D(4,4)

Let C(x₂ , y₂)

$$\text{Midpoint} = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right) = (4,4)$$

$$\Rightarrow \frac{1 + x_2}{2} = 4; \frac{4 + y_2}{2} = 4$$

$$\Rightarrow 1 + x_2 = 2 \times 4; 4 + y_2 = 2 \times 4$$

$$x_2 = 8 - 1 = 7; y_2 = 8 - 4 = 4.$$

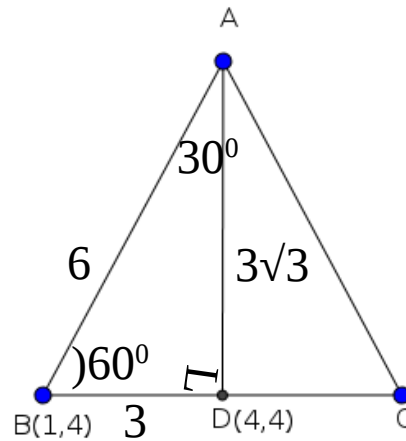
Hence the coordinates of C = (7, 4).

(b) Length BD = 4 - 1 = 3

30°, 60°, 90° .

1 : √3 : 2.

Coordinates of A = (4, 4 + 3√3)



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17. Surface area of a solid sphere is 400π square centimetres.

- a) What is the radius of the sphere?
 b) How many small spheres of radius one centimetre can be made by melting and recasting the given sphere?
 c) How many small spheres of radius one centimetre can be made by melting and recasting a solid hemisphere of total surface area 300π square centimetres?

Solution:-

Given TSA = 400 π

(a) ie., 4 π r² = 400 π r = 10cm.

(b) Radius of small sphere = 1cm.

$$\text{Number of sphere} = \frac{\text{Volume of sphere}}{\text{Volume of small sphere}}$$

$$\text{Volume of sphere} = \frac{4}{3}\pi r^3 = \frac{4}{3}\pi \times 10^3 = \frac{4000}{3}\pi$$

$$\text{Volume of small sphere} = \frac{4}{3}\pi r^3 = \frac{4}{3} \times \pi \times 1^3 = \frac{4}{3}\pi$$

$$\text{Number of sphere} = \frac{4000\pi}{3} / \frac{4\pi}{3} = 1000.$$

(c) TSA = $300 \cdot \pi$ ie, $3\pi r^2 = 300\pi$; $r = \sqrt{100} = 10$ cm

$$\text{Numbers} = \frac{\text{Volume of hemisphere}}{\text{Volume of small sphere}}$$

$$\text{Volume of hemisphere} = \frac{2}{3}\pi r^3 = \frac{2000\pi}{3}$$

$$\text{Volume of small sphere} = \frac{4}{3}\pi r^3$$

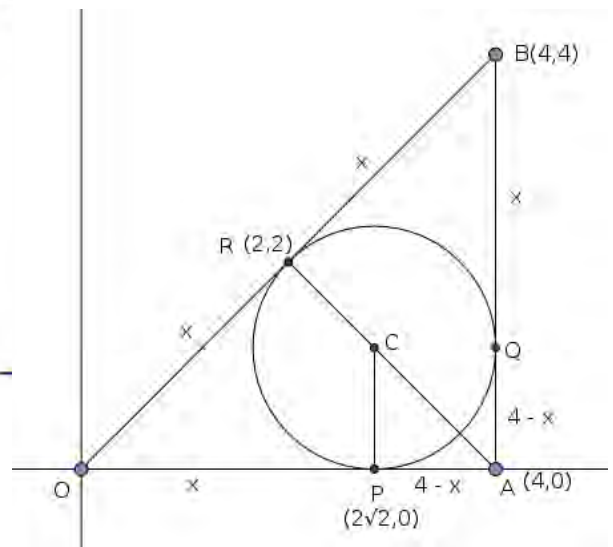
$$\text{Numbers} = \frac{2000\pi}{3} / \frac{4\pi}{3} = 500.$$

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Solution:-

18. In the figure, coordinates of the point B are (4,4)
The circle touches the right angled triangle at the points P, Q, R.

- a) Write the coordinates of A.
- b) What are the coordinates of R?
- c) What is the length of OP?
- d) Find the coordinates of P.



Solution :-

- (a) Coordinates of A = (4,0)
 (b) $OA = AB = 4$, $OB = 4\sqrt{2}$ (using distance formula)
 [Equal length of tangents]
 $OR = OP$, $AP = AQ$, $BQ = BR$
 If $BQ = x$, $AQ = 4 - x$
 $AP = 4 - x$, $OP = 4 - (4 - x) = x$.
 ie., $OR = x$, $BR = x$
 ie., R is the mid point of OB. ie., $R = (2,2)$.
 (c) $OB = 4\sqrt{2}$; ie., $2x = 4\sqrt{2}$, so, $x = 4\sqrt{2} / 2 = 2\sqrt{2}$
 ie., $OP = 2\sqrt{2}$
 (d) $P(2\sqrt{2} , 0)$.

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19. The inradius of a triangle is 2.5 centimetres and two of its angles are 60° , 50° . Draw the triangle.

Solution:-

Do the construction by yourself.

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20. Radii of two spheres are in the ratio 2:3.

- a) What is the ratio of their surface areas?
 b) Find the ratio of their volumes.

Solution :-

Given ratio of radii = 2 : 3.

(a) Ratio of TSA = $4\pi r^2 : 4\pi r^2$; $\Rightarrow 4\pi \times 2^2 : 4\pi \times 3^2$
 $= 4 : 9$.

(b) Ratio of volumes = $\frac{4}{3}\pi r^3 : \frac{4}{3}\pi r^3$, $\Rightarrow \frac{4}{3}\pi \times 2^3 : \frac{4}{3}\pi \times 3^3$
 $= 8 : 27$.

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21. a) Write the sequence of multiples of 4.
 b) Write the algebraic expression to state that the product of two consecutive terms of this sequence is 320.
 c) What number should be added to the product of any two consecutive terms of this sequence to get a perfect square?

Solution:-

(a) The sequence of multiple of 4 = 4,8,12,16,20,.....

(b) $d = 8 - 4 = 4$

Algebraic form ,

Let the first term be x , next term $x + 4$

By question $\Rightarrow x(x + 4) = 320$.

$\Rightarrow x^2 + 4x - 320 = 0$ be the algebraic form.

(c) $x^2 + 4x = 320$. add 4 to both side

$\Rightarrow x^2 + 4x + 4 = 320 + 4$

$\Rightarrow x^2 + 4x + 4 = 324$.

$\Rightarrow (x + 2)^2 = 18^2$.

Hence, In this sequence add 4 to get a perfect square any two consecutive terms.

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22. In the figure, $\angle A = 82^\circ$, $\angle B = 49^\circ$, $BC = 5$ centimetres.

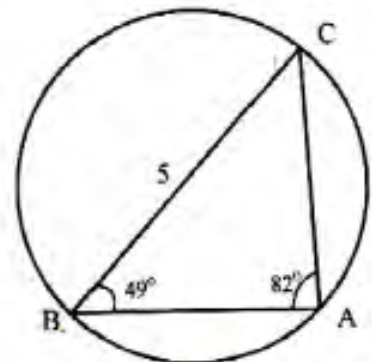
a) Calculate circumradius of the triangle.

b) What is the length of AC?

c) Find the perimeter of the triangle.

($\sin 82^\circ = 0.99$, $\cos 82^\circ = 0.14$,

$\sin 49^\circ = 0.75$, $\cos 49^\circ = 0.66$)



Solution:-

Given , $\angle A = 82^\circ$, $\angle B = 49^\circ$, $BC = 5$ cm.

(a) We know, $2r = \frac{a}{\sin A}$, $\Rightarrow 2r = \frac{5}{\sin 82}$, $\Rightarrow 2r = \frac{5}{0.99}$

$\Rightarrow r = 2.5$ cm.

(b) $\angle C = 180 - (82 + 49) = 49^\circ$.

Similarly $2r = \frac{b}{\sin B}$, $b = AC = 2r \times \sin 49^\circ$.

$$= 2 \times 2.5 \times 0.75$$

$$= 3.75\text{cm.}$$

(c) $\angle C = 180 - (82 + 49) = 49^\circ$.

ie., $AB = 3.75$.

Perimetre = $AB + BC + AC = 5 + 3.79 + 3.79 = 12.58\text{cm.}$

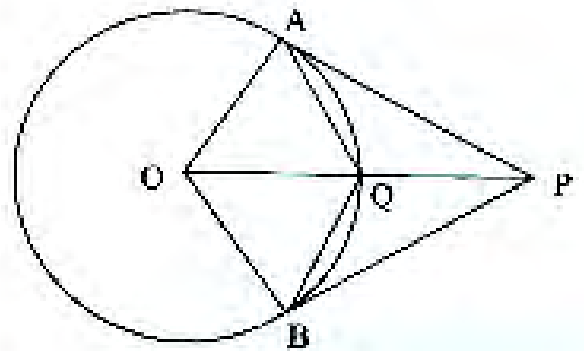
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23. In the figure, PA and PB are tangents to the circle with centre O. If $OP = 2 OB$,

a) Find the measures of $\angle AOB$ and $\angle BQA$.

b) Prove that triangle QPB is isosceles.

c) If $QB = 5$ centimetres, what is the circumradius of quadrilateral OAPB?



Solution:-

Given PA and PB are tangent ; $OP = 2OB$.

(a) $OP = 2 OB$.

$$\angle OAP = 90^\circ$$

ie., $OB = x$, $OP = 2x$.

$$BP = \sqrt{3} x$$

ie., $\angle AOP = 60^\circ$.

$$\angle APO = 30^\circ$$

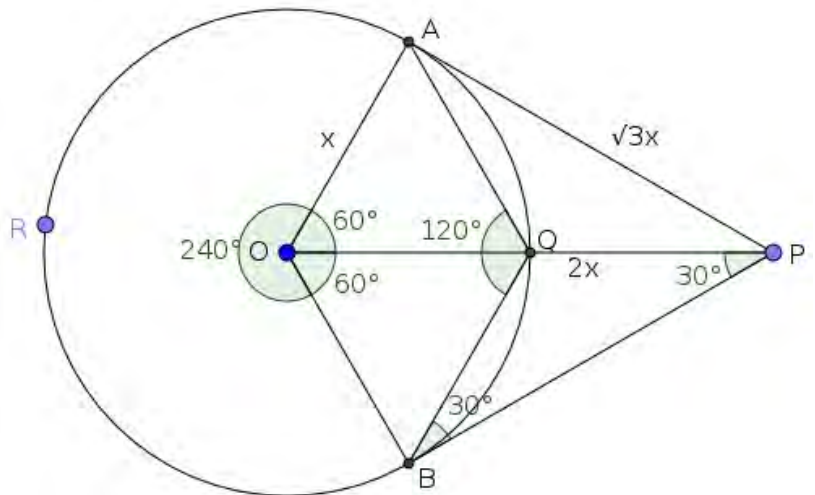
ie., $\angle AOB = 120^\circ$.

centre angle of the arc

$$360 - 120 = 240^\circ$$

ie., $\angle BQA = 240/2 = 120^\circ$.

(b) $\angle BPQ = 30^\circ$. [chord theorem]



ie., triangle QPB is an isosceles .

(c) $OB = 5\text{cm}$.

$OB = OQ = PQ = BQ = AQ = 5\text{cm}$.

ie., 5cm be the circum circle radius of OAPB.

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24. A boy standing on a level ground, sees the top of a tower at an elevation of 40° . After walking 30 metres towards the tower, he sees it at an elevation of 80° . Draw a rough figure and calculate the height of the tower.

($\sin 80^\circ = 0.98$, $\cos 80^\circ = 0.17$, $\tan 80^\circ = 5.67$, $\sin 40^\circ = 0.64$, $\cos 40^\circ = 0.77$, $\tan 40^\circ = 0.84$)

Solution:-

In figure,

Height of the tower = BC.

Let A be the first position of the boy and D be the second position after moving 30m.

ie., $AD = 30\text{m}$.

$\angle A = 40^\circ$, $\angle D = 80^\circ$.

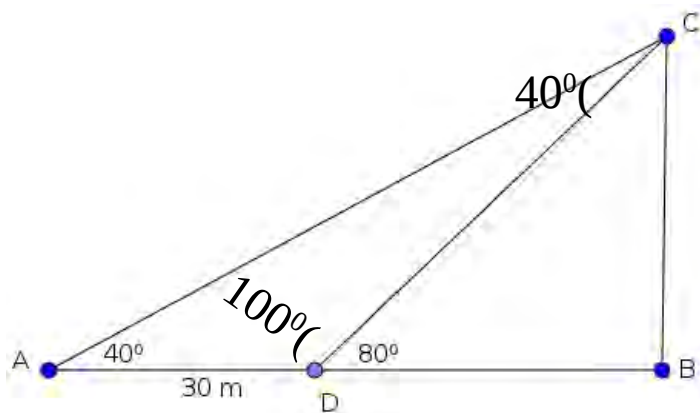
In triangle ADC, $\angle ACD = 180 - (100 + 40) = 40^\circ$.

Triangle ADC be an isosceles . So $AD = DC = 30\text{m}$.

In triangle DCB, $\sin 80^\circ = \frac{\text{opp. side}}{\text{hpy}} = \frac{BC}{DC}$

$0.98 = BC/30$; $BC = 0.98 \times 30 = 29.4\text{m}$.

Hence, the height of the tower = 29.4m.



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25. Three vertices of a parallelogram are the points $(-3, 1)$, $(0, 5)$, $(5, 5)$.

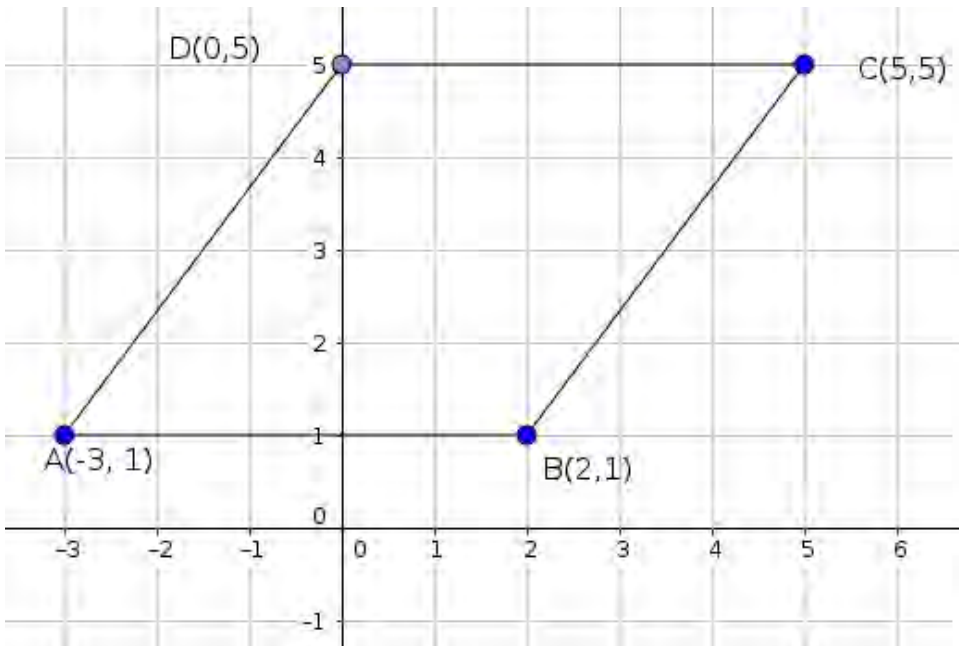
a) Draw the axes and the parallelogram.

b) Write the coordinates of the fourth vertex of the parallelogram.

c) Calculate the area of the parallelogram.

Solution:-

(a)



(b) Fourth coordinate = (2, 1).

(c) Area of the parallelogram = $bh = 5 \times 4 = 20$ (see the figure)

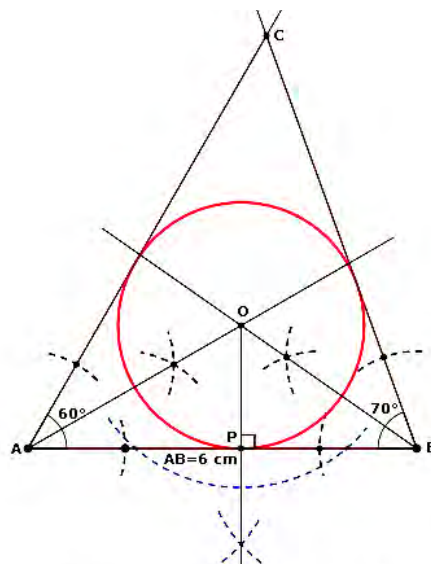
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26. Draw triangle ABC with $AB = 6$ centimetres, $\angle A = 60^\circ$, $\angle B = 70^\circ$. Draw its incircle and measure the radius.

Solution:-

Construction.

Construct the triangle by the given measurement. Draw two angle bisector of angle A and B and intersect at O. Take OP as radius and draw a circle. Measure the radius
Radius = 1.9cm.



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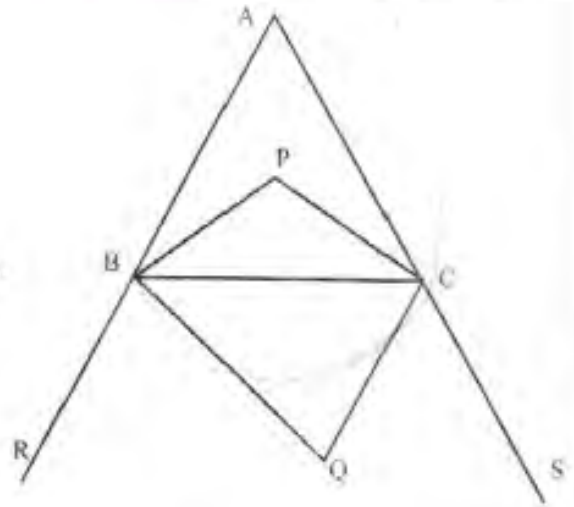
27. In the figure, P is the incentre of triangle ABC, Q is the centre of one of its excircles.

a) If $\angle ABC = x$, $\angle PBC =$ _____

b) $\angle QBC =$ _____

c) Prove that quadrilateral PBQC is cyclic.

d) If $BC = 5$ centimetres, $PQ = 6$ centimetres, what is the circum radius of quadrilateral PBQC?



Solution:-

(a) Given $\angle ABC = x$, The $\angle PBC =$ Half of $x = \frac{x}{2}$

(b) $\angle ABC + \angle RBC = 180^\circ$.

$$\angle RBC = 180 - \angle ABC$$

$$= 180 - x.$$

$$\text{ie., } \angle QBC = \frac{180 - x}{2} = 90^\circ - \frac{x}{2}$$

(c) $\angle PBQ = \angle PBC + \angle QBC = \frac{x}{2} + 90^\circ - \frac{x}{2} = 90^\circ$.

Similarly, $\angle PCQ = 90^\circ$.

$$\text{ie., } \angle PBQ + \angle PCQ = 90 + 90 = 180^\circ.$$

ie., PBQC be cyclic quadrilateral.

(d) $\angle PBQ = \angle PCQ = 90^\circ$.

ie., the hypotenuse PQ's mid point be the circum radius

So, $PQ = 6\text{cm}$.

Hence, the circum radius $= \frac{6}{2} = 3\text{cm}$.

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28. The figure of a petrol tank is given below. Its total length is 6 metres and radius is one metre. How many litres of petrol can it hold?



Solution:-

Given, total length = 6m. Radius = 1m

Height of the cylinder = 6 – 2 = 4m.

Volume of the combination = Volume of the cylinder + volume of the sphere.

$$\text{ie., } \pi r^2 h + \frac{4}{3} \pi r^3$$

$$\pi \times 1^2 \times 4 + \frac{4}{3} \times \pi \times 1^3$$

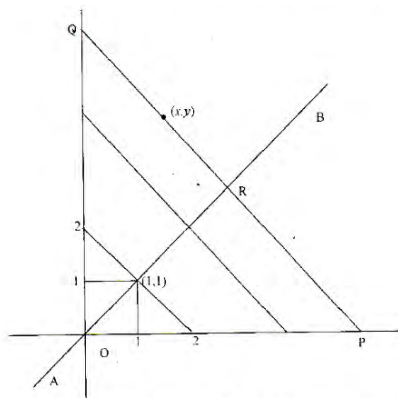
$$4 \pi + \frac{4}{3} \times \pi = \frac{12\pi + 4\pi}{3} = \frac{16\pi}{3} = \frac{16 \times 3.14}{3} = 16.74667 \text{m}^3 .$$

Tank hold petrol = 16.74667 × 1000 = 167466.7 litres.

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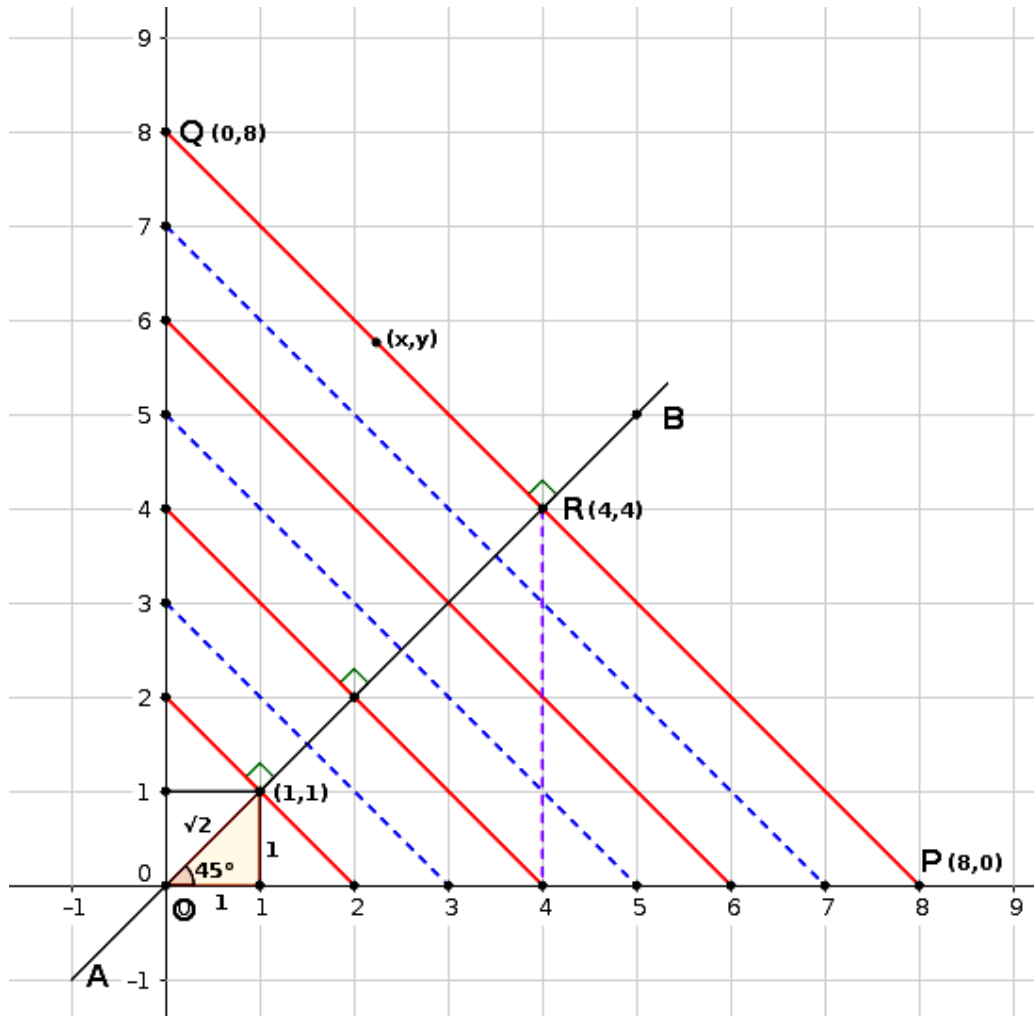
Read the following mathematical idea and answer the questions that follow.

29. In the figure, the line AB passes through the points (0,0), (1,1), (2,2). We can observe an interesting fact about the coordinates of points on lines perpendicular to AB. For example, if PQ is perpendicular to AB and R is the point of their intersection with coordinates (a,a), then sum of the coordinates of any point on PQ will be 2a.



- a) If the x coordinate of a point on AB is $\sqrt{3}$, what is its y coordinate? (1)
- b) If $(1,7)$ is a point on PQ , write the coordinates of the points P , Q and R (3)
- c) What is the perpendicular distance from R to the x axis? (1)
- d) What is the measure of $\angle POB$? (1)

Solution:-



- (a) x coordinate $\sqrt{3}$ ie., y coordinate also $\sqrt{3}$.
- (b) x coordinate of $P = 8$ and y coordinate be 0 .
 coordinate of P be $(8,0)$
 x coordinate of $Q = 0$ and y coordinate be 8 .
 coordinate of P be $(0,8)$
 x coordinate of $R = 4$ and y coordinate be 4 .

coordinate of R be (4,4)

(c) See the figure,
Perpendicular distance from R to x axis = 4

(d) $\angle POB = 90/2 = 45^\circ$.

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**The end the Second Terminal Evaluation 2018 -19
Mathematics Questions and Solutions**

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