SSLC Model Examination March 2021

Mathematics – English Version.

Detailed Solutions with Questions.

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Question. 1

What is the common difference of the arithmetic sequence 4, 10, 16, ... ?
[4, 5, 6, 10]

Solution.

Given sequence = 4,10,16,.....

Common difference = $x_2 - x_1$

= 10 - 4 = 6.

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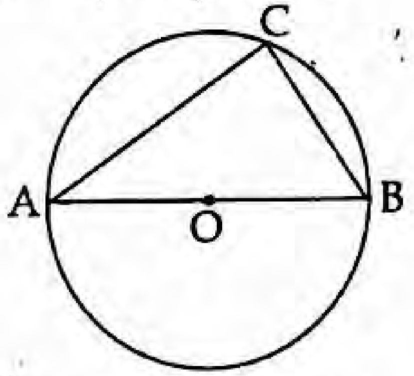
Question. 2.

In the figure O is the centre of the circle. Write the measure of $\angle ACB$.
[$30°, 60°, 90°, 100°$]



Solution.

$\angle ACB = 90^0$ (Angle in semi circle).

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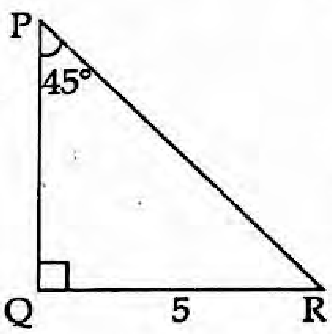
Question. 3.

In triangle PQR, $\angle Q = 90°$, $\angle P = 45°$, $QR = 5$ centimetres. What is the length of PR ?

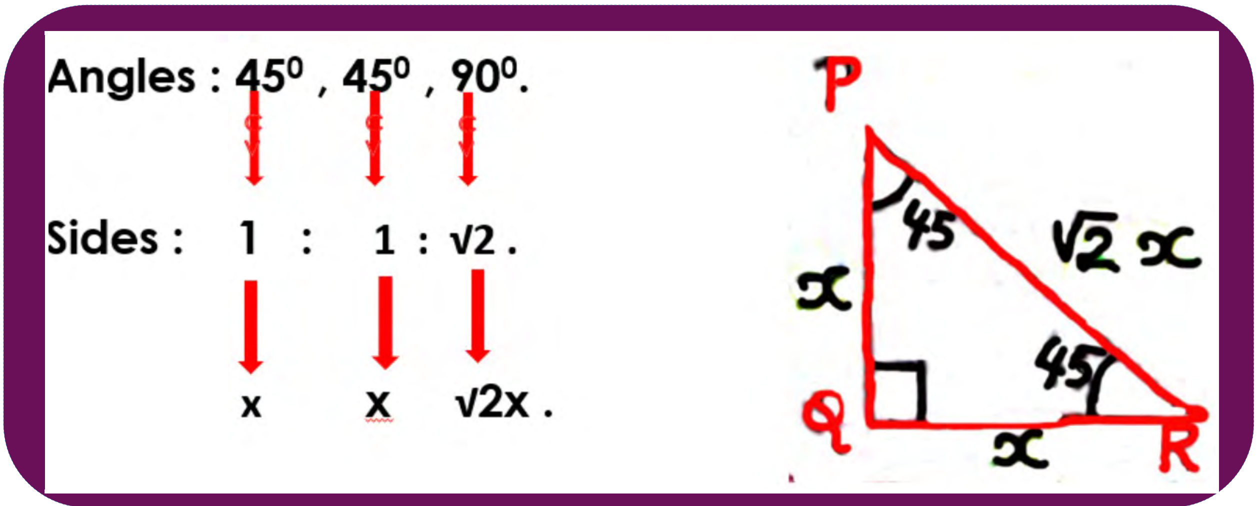
$\left[10\sqrt{2}, 5\sqrt{2}, 10, \frac{5}{\sqrt{2}}\right]$



Solution.

ΔPQR be rt. isosceles triangle

$\therefore \angle P = \angle R\ 45^0$.



$PR = x\sqrt{2} = 5\sqrt{2}$

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Question. 4.

Which of the following is a point on the x-axis ?

[(3, 0), (0, 3), (−3, 2), (0, −2)]

Solution.

(3,0). [y = 0 becomes x axis)

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Question. 5.

Which of the following is the midpoint of the line joining (6, 2) and (12, 2) ?

[(8, 2), (10, 2), (2, 8), (9, 2)]

Solution.

$$\text{Given points} = \overset{x_1, y_1}{(6,2)}\ \overset{x_2,\ y_2}{(12,2)}$$

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

$$= \left(\frac{6+12}{2}, \frac{2+2}{2}\right)$$

$$= \left(\frac{18}{2}, \frac{4}{2}\right) = (9,\ 2).$$

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Question. 6.

Algebraic form of an arithmetic sequence is $3n+2$.

(a) What is its first term ?

(b) Find its 10^{th} term.

Solution.

Given $x_n = 3n + 2$

(a). Put n= 1, get the first term

ie., first term = $3 \times 1 + 2 = 5$.

(b) 10^{th} term ; put n = 10

ie., $3 \times 10 + 2 = 32$.

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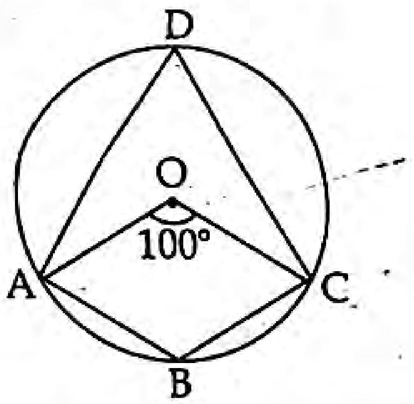
Question. 7.

A, B, C and D are points on the circle with centre O. $\angle AOC = 100°$.



(a) What is the measure of $\angle ADC$?

(b) Find $\angle ABC$.

Solution.

Given $\angle AOC = 100^0$.

a). Measure of $\angle ADC = \frac{1}{2} \times 100$

$= 50^0$.

b) $\angle ABC = 180 - 50 = 130^0$.

[ABCD be a cyclic quadrilateral]

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Question. 8.

One is asked to say a natural number from 1 to 20.

(a) What is the probability of it being an even number ?

(b) What is the probability of it being a multiple of 5 ?

Solution.

a) Given natural numbers 1 to 20.

Total numbers n(N) =20.

From this even numbers

= 2,4,6,8,10,12,14,16,18,20

ie., n(F) = 10.

Hence the probability = n(F) / n(N)

$$= \frac{10}{20} = \frac{1}{2}.$$

b) Multiple of 5 are 5,10,15,20.

ie., n(F) = 4

Hence the probability = n(F) / n(N)

$$= \frac{4}{20} = \frac{1}{5}$$

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Question. 9.

Write the second degree polynomial $x^2 - 16$ as the product of two first degree polynomials.

Solution.

Given polynomial = $x^2 - 16$

The first drgree polynomial

$= (x + 4)(x - 4)$.

$[\because (a+b)(a-b) = a^2 - b^2)]$

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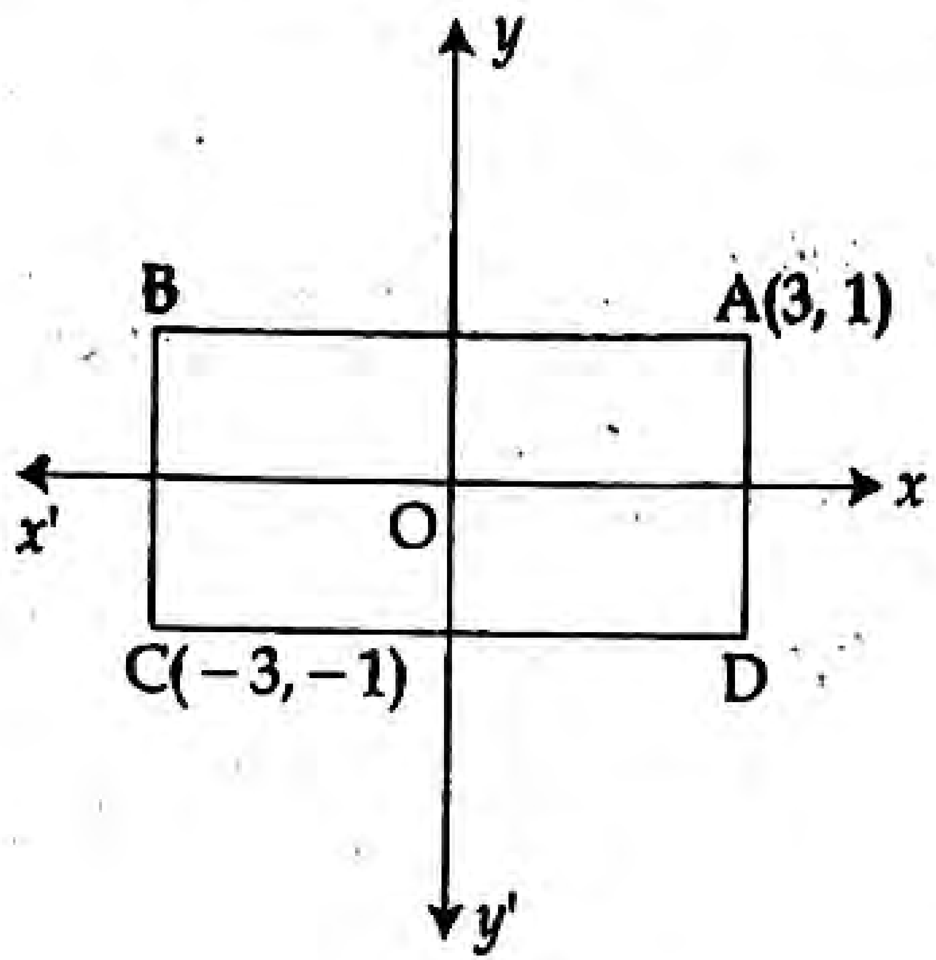
Question. 10.

I n the figure the sides of the rectangle ABCD are parallel to the axes. Two of its vertices are A(3,1) and C(- 3 , - 1) . Write the coordinates of B and D.



Solution.

From the figure we can directly observed that

B(+3, 1) and D(3,-1).

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Question. 11.

The 5^{th} term of an arithmetic sequence is 20 and the 8^{th} term is 32

(a) What is the common difference of this sequence ?

(b) Find its 11^{th} term.

Solution.

Given, 5^{th} term of an AP is 20 and 8^{th} term is 32.

a)

Here we know that , term difference is proportional to position difference, and the constant of proportionality is the common difference ie., $\frac{X_m - X_n}{m-n} = d$

ie., $\frac{32-20}{8-5} = \frac{12}{3} = 4.$

b). Given 5^{th} term = 20.

ie., f + 4d = 20.

$f + 4 \times 4 = 20$

f = 20 - 16 = 4.

Hence 11^{th} term = f + 10d

$= 4 + 10 \times 4$

= 44.

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Question. 12.

x is a natural number.

(a) What number should be added to x^2+2x to get a perfect square

(b) If $x^2+2x=15$. Find the natural number represented by x.

Solution.

Given x is a natural number.

a) 1 is added to $x^2 + 2x$ get a perfect square

[$\because$ $x^2 + 2x + 1$ be $(a + b)^2$ form]

b) Given $x^2 + 2x = 15$

[by square completion method or factorization method or quadratic method]

$x^2 + 2x + 1 = 15 + 1$

$(x + 1)^2 = 16.$

$x + 1 = \sqrt{16} = 4.$

$x = 4 - 1 = 3.$

$\therefore$ the natural number representrd by $x = 3$.

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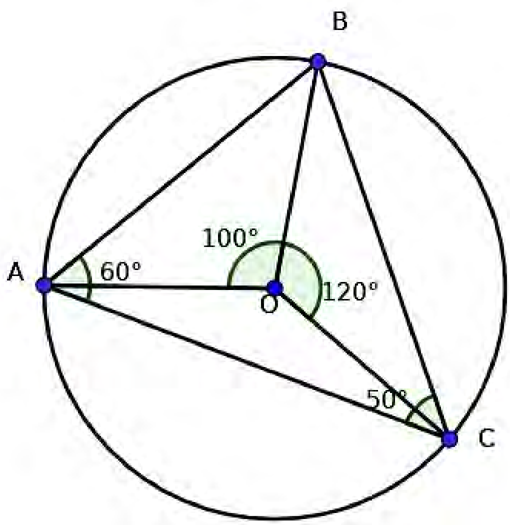
Question. 13.

The vertices of a triangle are points on a circle of radius 3 centimetres. If two angles of this triangle are 50° and 60°, draw the triangle.

Solution.



Construction:

Draw a circle with radius 3cm O as the center. Draw OB and make an $\angle AOB = 100^0$ $(2 \times 50 = 100)$.make an $\angle BOC = 120^0$.($2 \times 60 = 120$) and join AB,BC and AC.

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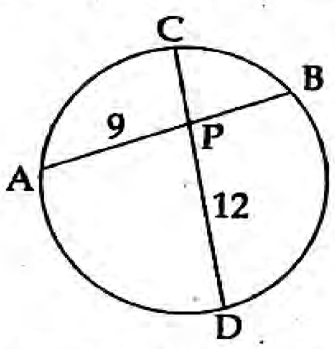
Question. 14.

The chords AB and CD intersect at P. AB = 17 centimetres, PA = 9 centimetres, PD = 12 centimetres.



(a) What is the length of PB ?

(b) Find the length of PC.

Solution.

Given, AB= 17cm, PA = 9cm,

PD = 12cm.

a) Length of PB = AB – PB

= 17 – 9 **=8cm**

b) We know thatPA x PB = PC x PD

ie.,9 x 8 = PC x 12

PC = 72/12 **= 6 cm.**

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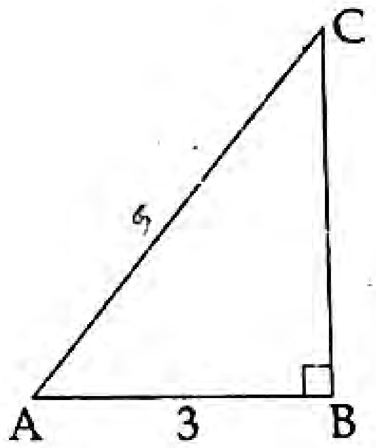
Question. 15.

In triangle ABC, $\angle B = 90°$, $AB = 3$ centimetres, $\cos A = \frac{3}{5}$.



(a) What is the length of AC ?

(b) Find $\sin A$.

Solution.

Given ΔABC is a rt. triangle

$AB = 3$, $\cos A = \frac{3}{5}$.

a) $\cos A = \frac{Adj}{Hpy} = \frac{AB}{AC} = \frac{3}{5}$

ie., $AC = 5$.

b) Here $AB = 3$, $AC = 5$

ΔABC is a rt. triangle

By Pythagoras,

$BC^2 = AC^2 - AB^2$

$= 5^2 - 3^2 = 25 - 9 = 16$

$\therefore BC = \sqrt{16} = 4$.

$$\sin A = \frac{Opp}{Hpy} = \frac{BC}{AC} = \frac{4}{5}.$$

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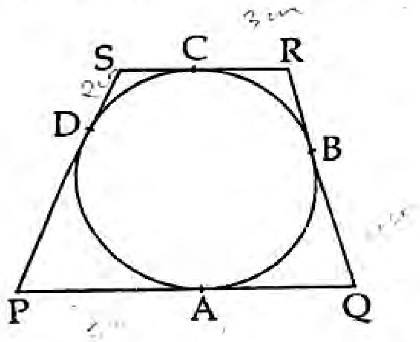
Question. 16.

In the figure, the circle touches the sides of the quadrilateral PQRS at A, B, C and D.
PA = 5 centimetres, QB = 4 centimetres, RC = 3 centimetres, SD = 2 centimetres.



(a) What is the length of PD ?

(b) Find the perimeter of the quadrilateral PQRS.

Solution.

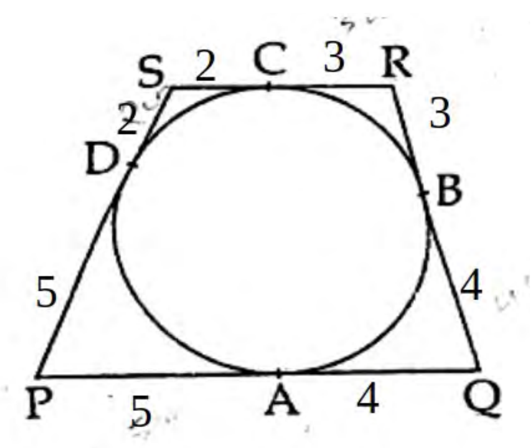
Given PA = 5cm, QB = 4cm,

RC = 3cm, SD = 2cm.

a) The length of PD = PA = 5cm

[length of same tangent]

b).



From the figure perimetr

=PA+AQ+QB+BR+ RC+CS+SD+DP

= 5+4+4+3+3+2+2+5 = 28cm.

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Question. 17.

The base radius and slant height of a cone are 6 centimetres and 10 centimetres respectively.

(a) What is its height ?

(b) Find its volume.

Solution

Given, r = 6cm, l = 10cm.

a) Height = $\sqrt{l^2 - h^2}$ = $\sqrt{10^2 - 6^2}$

= $\sqrt{100 - 36}$ = $\sqrt{64}$

= 8cm.

b). Volume = $\frac{1}{3} \times \pi r^2$.

$$= \frac{1}{3} \times \pi \times 6^2 \times 8 = 96\pi \text{ cm}^3$$

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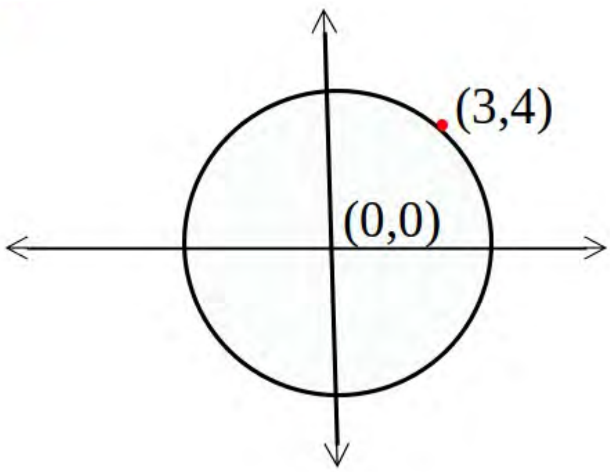
Question. 18.

(3, 4) is a point on a circle with centre at the origin.

(a) Find its radius.

(b) Write the coordinates of the points where the circle cuts the x-axis.

Solution.



Equation of the circle $x^2 + y^2 = r^2$

$$\text{radius} = \sqrt{3^2+4^2}$$

$$= \sqrt{9+16} = \sqrt{25}$$

$$= 5.$$

Coordinates be (5,0) or (-5,0)

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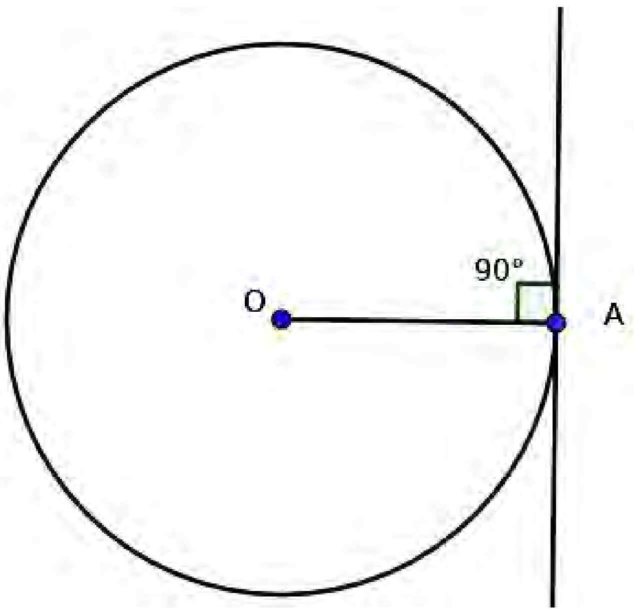
Question. 19.

Draw a circle of radius 3 centimetres. Mark a point A on the circle and draw tangent through A.

Solution.

Construction.



Draw a circle with a radius 3cm O as its center. Draw OA line and draw perpendicular to OA throw A.

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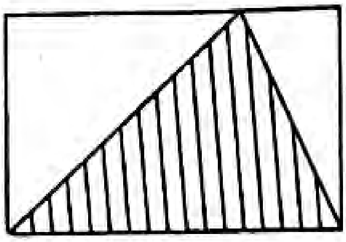
Question. 20.

In the figure, the area of the rectangle is 40 square centimetres.



(a) What is the area of the shaded triangle ?

(b) If a dot is put in the figure without looking into it. What is the probability of it being inside the shaded triangle ?

Solution.

Given, the area of the rectangle

$= 40\ cm^2$.

a) Area of the shsded triangle

$$= \frac{1}{2} \times 40 = 20cm2 .$$

b) Probability =

$$\frac{area\, of\, the\, shaded\, region}{Total\, area\, of\, the\, rectangle}$$

$$= \frac{20}{40} = \frac{1}{2} .$$

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Question. 21.

The 10^{th} term of an arithmetic sequence is 20 and its 20^{th} term is 10.

(a) What is its common difference ?

(b) What is its 30^{th} term ?

(c) Which is the first negative term of this sequence ?

Solution.

Given, 10^{th} term = 20,

20^{th} term = 10.

Here we know that , term difference is proportional to position difference, and the constant of proportionality is the common difference ie., $\dfrac{X_m - X_n}{m-n} = d$

a) ie.,d = $\dfrac{10-20}{20-10} = \dfrac{-10}{10} = -1.$

b). Given 10^{th} term - 20

ie., $f + 9d = 20$

$f + 9 \times -1 = 20$

$f = 20 + 9 = 29$

Hence the 30^{th} term $= f + 29d$

$= 29 + 29 \times -1$ **$=0$**

c). Here 30^{th} term is 0

$\therefore$ the 31^{st} term be -1.

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Question. 22.

1, 3, 5, ... is an arithmetic sequence.

(a) What is its 20^{th} term ?

(b) Find the sum of first 20 terms of this sequence.

(c) What is the sum of first 20 terms of the arithmetic sequence 6, 8, 10, ... ?

Solution.

Give sequence 1, 3, 5,........

f = 1 ; d - 3 - 1 = 2.

a) 20^{th} term = f + 19d

$= 1 + 19 \times 2$ **= 39.**

b) Sum of 1^{st} 20 term = n^2

$= 20^2$ **= 400.**

c). Given sequence 6,8,10,.......

f = 6, d = 8 - 6 = 2.

$x_{20} = f + 19d = 6 + 19 \times 2$

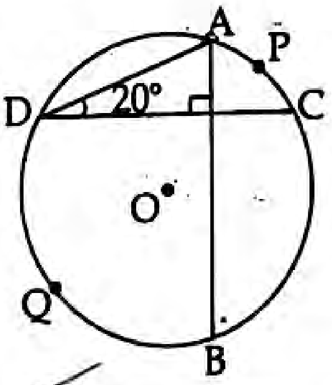
$= 44$.**(x_n)**

$$\text{Sum} = \frac{n}{2}(x_1 + x_n)$$

$$= \frac{20}{2}(6 + 44)$$ **= 500.**

Question. 23.

In the figure, O is the centre of the circle. AB and CD are two perpendicular chords. $\angle D = 20°$.



(a) Write the measure of $\angle A$.

(b) What is the central angle of arc BQD ?

(c) What is the central angle of arc APC ?

Solution.

a) Measuremet of $\angle A$

$$= 180 - (90+20) = 70^0$$

b). Center angle of arc BQD

$$= 2 \times \angle A = 2 \times 70 = 140^0 .$$

c) Center angle of arc BAPC

$= 2 \times \angle D = 2 \times 20 = 40^0$.

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Question. 24.

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(a) Perimeter of a rectangle is 40 centimetres. Write a pair of numbers that can be the measures of its sides.

(b) Perimeter of a rectangle is 40 centimetres and its area is 84 square centimetres. Find the lengths of its sides.

Solution.

a) Given perimeter = 40cm.

ie., $2(l+b) = 40$

$l + b = 40/2 = 20.$

Here we can write so many pair of numbers . Only we get the sum of two numbers becomes 20

such as 13,7; 11,9; 15,5; and so on.

b) Perimeter = 40cm

Area = 84 cm^2 .

ie., $2(l+b) = 40$

$l + b = 40/2 = 20.$

Let length be 'x' ,

breadth 20- x

Area = 84

ie., $l \times b = 84$

$x(20 + x) = 84$

$20x - x^2 = 84$

$x^2 - 20x = -84$ **(apply square completion method)**

$x^2 - 20x + 100 = -84 + 100$

$(x - 10)^2 = 16$

$x - 10 = \sqrt{16} = 4$

$x = 4 + 10 = 14.$

Hence length = 14 cm

breadth = 20 - 14 = 6cm.

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Question. 25.

A box contains 6 black beads and 4 white beads. Another box contains 5 black beads and 3 white beads. If we take one bead from each box without looking :

(a) What is the total number of pairs ?

(b) What is the probability that both are black ?

(c) Find the probability of one being black and the other being white.

Solution.

	Box - 1	Box - 2
Black beads	6	5
White beads	4	3
Total	10	8

a) Total number of pairs

$= m \times n = 10 \times 8 = 80.$

b) Total number of both black

= m × n = 6 × 5 = 30.

Probability = n(F)/n(N) = 30/80

= 3/8.

c) Probability being one black and one being white

$$= \frac{4\times5}{80} + \frac{6\times3}{80} = \frac{20}{80} + \frac{18}{80}$$

$$= \frac{38}{80} = \frac{19}{40}.$$

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Question. 26.

(a) $P(x) = x^2 - 5x + 10$. What number is P(2) ?

(b) Write $P(x) - P(2)$ as the product of two first degree polynomials.

Solution.

a) Given $P(x) = x^2 - 5x + 10$

$P(2) = 2^2 - 5 \times 2 + 10 = 4$.

b) $P(x) - P(2) = x^2 - 5x + 10 - 4$

$= x^2 - 5x + 6$ [factorize]

$= (x - 3)(x - 2)$

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Question. 27.

(a) Draw a circle of radius 3 centimetres.

(b) Mark a point P at a distance of 7 centimetres from its centre.

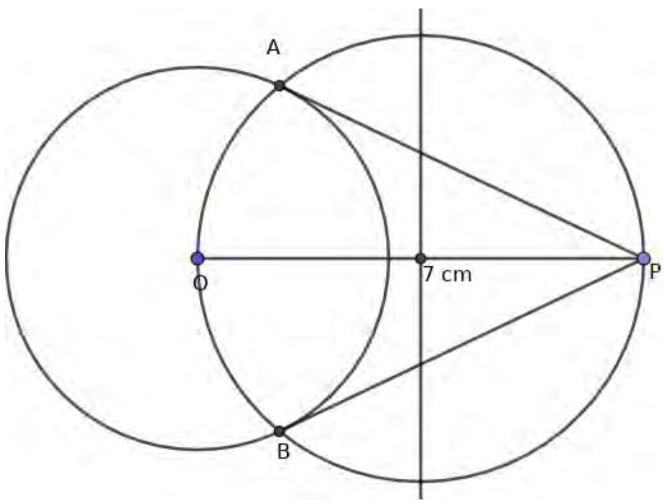
(c) Draw tangents from P to this circle.

Solution.

a)

b)

c)



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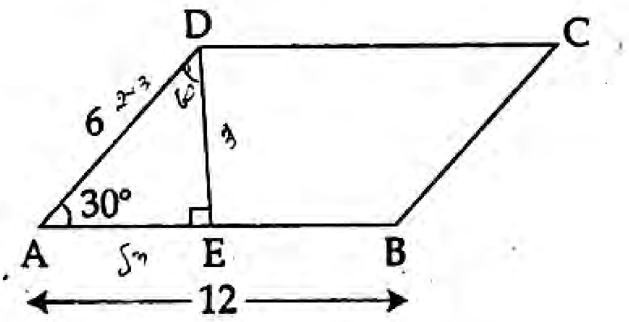
Question. 28.

In the figure, ABCD is a parallelogram, $\angle A = 30°$, $AB = 12$ centimetres, $AD = 6$ centimetres.



(a) Find the length of DE.

(b) Find the area of the parallelogram ABCD.

Solution.

Given AB = 12cm, AD = 6cm, $\angle A = 30^0$.

ΔAED be a rt. Triangle.

30^0 , 60^0 , 90^0 .

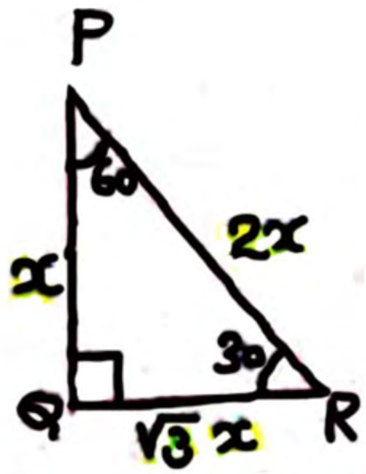
1 : $\sqrt{3}$: 2

[see the question figure]

Angles : 30^0 , 60^0 , 90^0.

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

x $\sqrt{3}x$ $2x$.



a) Length of DE = x = 3cm.

b) Area of ABCD = bh

$= 12 \times 3 = 36\text{cm}^2$.

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Question. 29.

The marks got by 6 students in an examination are given below.

26, 21, 32, 38, 45, 48

(a) Find the mean of the marks.

(b) What is the median mark ?

Solution.

Given data

= 26,21,32,38,45,48.

a)Mean = Sum / N

= 26+21+32+38+45+48/6

= 210/6 = **35.**

b). Median

Arrange the data in assenting order

ie., 21,26,32,38,45,48 .

$$\frac{32+38}{2} = \frac{70}{2} = 35.$$

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Question. 30.

1. A circle with centre at the origin cuts the y-axis at the point (0, 5).
   (a) Write the coordinates of other two points on this circle.
   (b) What is the radius of this circle ?
   (c) Verify whether the point (4, 4) lies on this circle.

Solution.

a) Other points

(0,-5), (5,0), (-5,0)

b) Radius = 5.

c) Find the distance between the points (4,4) and (0,0)

$$\sqrt{x^2+y^2} = \sqrt{4^2+4^2} = \sqrt{16+16}$$

$$= \sqrt{32}$$

we can see that $\sqrt{32}$ is grater than the radiou 5.

Hence the the point is not lies on the circle.

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Question. 31.

Look at the following number pattern.

$$\begin{array}{ccccc} & & 1 & & \\ & 2 & 3 & 4 & \\ 5 & 6 & 7 & 8 & 9 \end{array}$$

(a) Write the next line of this pattern.

(b) Write the sequence of last numbers in each line.

(c) What will be the last number in the 9^{th} line ?

(d) Write the first and last numbers of the 10^{th} line.

Solution.

a) Next lines of this pattern

10 11 12 3 14 15 16.

b) Last number in each line

1 , 4, 9 , 16 ,25 ,........

c) Number in the 9^{th} line

$9^2 = 81.$

d) First number of 10^{th} line= 82.

[$\because$ 9^{th} line number = 81]

Last number of 10^{th} line

$= 10^2 = 100.$

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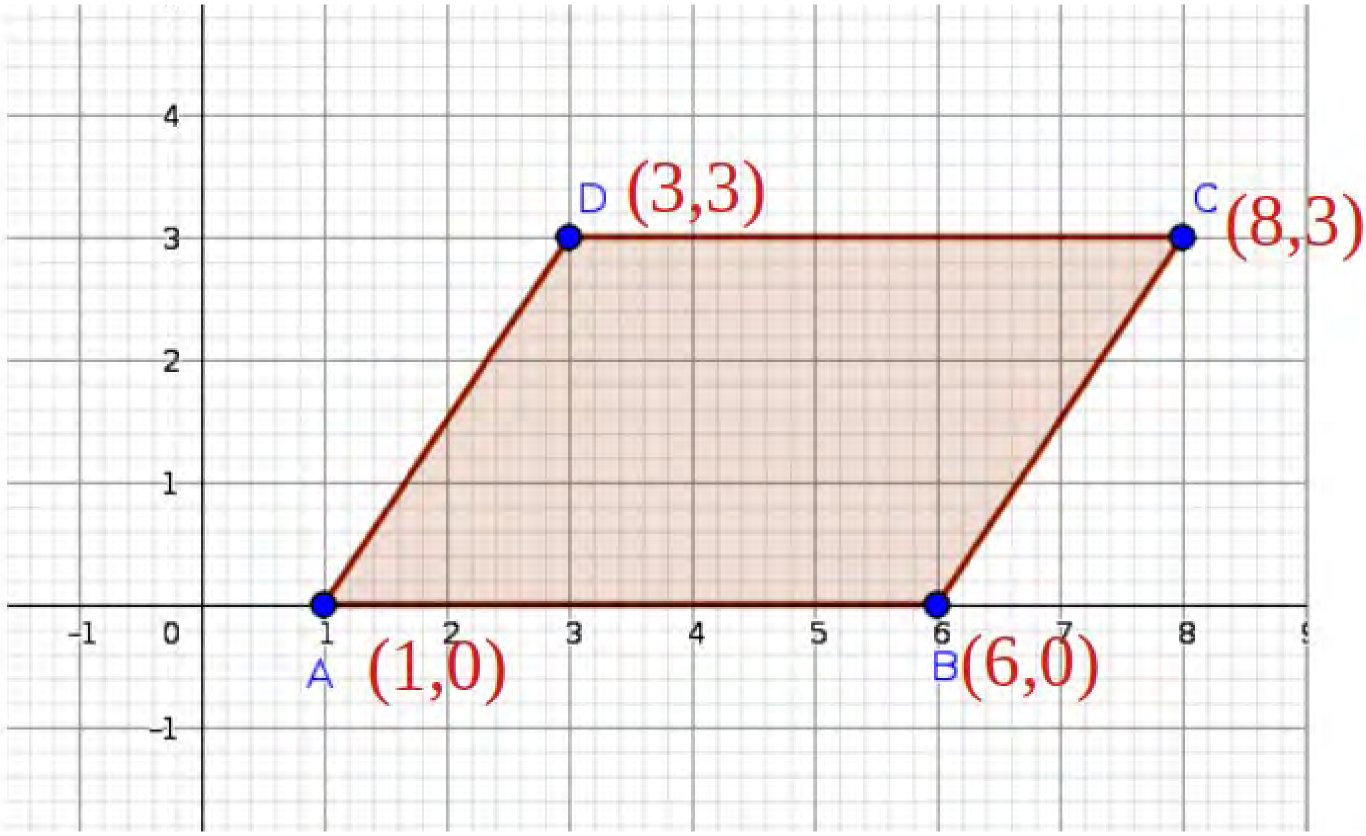
Question. 32.

(a) Draw the x, y axes and mark the points A(1, 0), B(6, 0), C(8, 3), D(3, 3).

(b) Write the most suitable name for quadrilateral ABCD.

(c) Find its area.

Solution.



b) ABCD be a Parallelogram.

c) Area = bh

$= 5 \times 3$ **=15.sq.unit**

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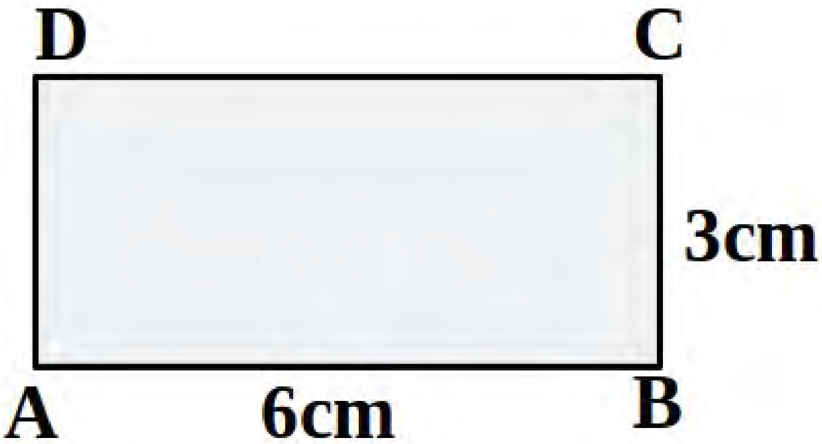
Question. 33.

3. (a) Draw a rectangle of sides 6 centimetres and 3 centimetres.

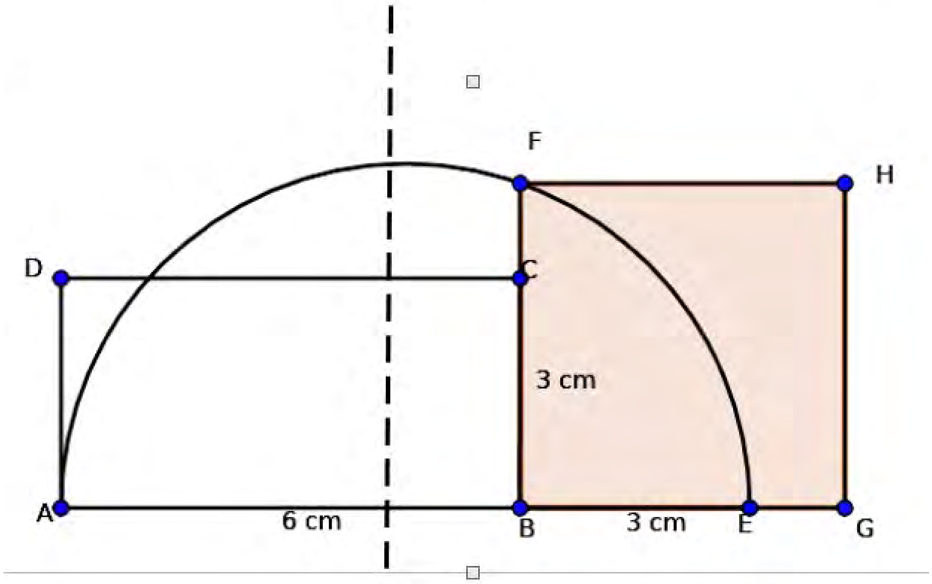
(b) Draw a square of same area.

Solution.

a)



b)



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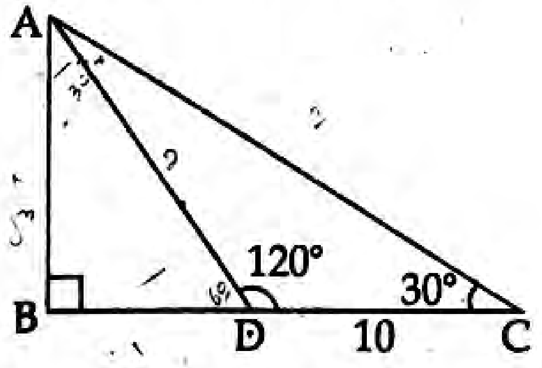
Question. 34.

In triangle ABC, $\angle B = 90°$, $\angle C = 30°$, $\angle ADC = 120°$. Also DC = 10 centimetres.



(a) What is $\angle DAC$?

(b) What is the length of AD ?

(c) Find $\angle ADB$.

(d) Find the lengths of BD and AC.

Solution.

Given, $\angle B = 90^0$, $\angle ADC = 120^0$

DC = 10cm. $\angle C = 30^0$.

a) In ΔADC , $\angle A = 180 - (120 + 30) = 30^0$.

In ΔABC ,

$\angle A = 180 - (90 + 30 + 30) = 30^0$.

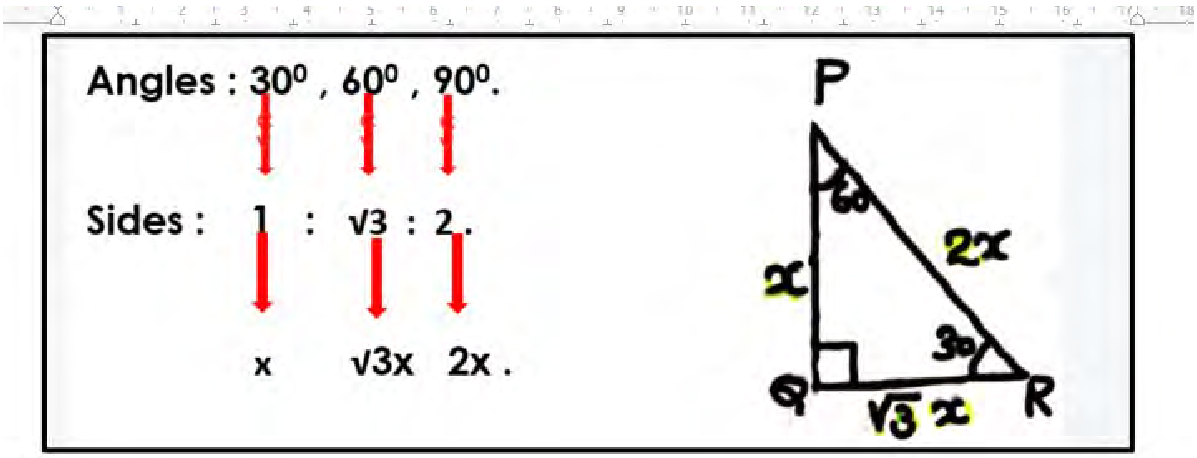
$\therefore \angle DAC$ **= 30^0 .**

ΔABD be a rt. triangle,

30^0 , 60^0 , 90^0 .

$1 : \sqrt{3} : 2$

[see the question figure]



BD = 10/2 = 5cm;(x)

BC = 5 + 10 = 15cm

AB = $x\sqrt{3}$ = $5\sqrt{3}$

b). AD = 2x **= 10cn**

c). Length of BD = 5cm.

In rt. triangle ABC

Length of $AC = \sqrt{AB^2+BC^2}$

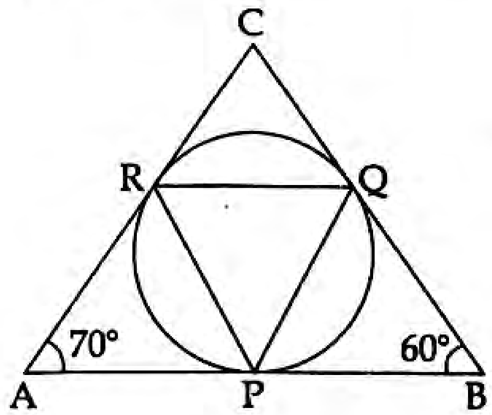
$= \sqrt{5\sqrt{3^2+15^2}} = \sqrt{75+225}$

$= \sqrt{300} = 10\sqrt{3}$ cm.

....drvsr

Question. 35.

In the figure, the circle touches the sides of triangle ABC at P, Q and R. $\angle A = 70°$, $\angle B = 60°$.



(a) What is the measure of $\angle BPQ$?

(b) What is $\angle PRQ$?

(c) Find the measures of other two angles of triangle PQR.

Solution.

Given, $\angle A = 70^0$, $\angle B = 60^0$.

a) Measurement of $\angle BPQ = 60^0$.

b) $\angle PRQ = 60^0$.

c) Other two angles are

$\angle PQR = 55^0$ and

$\angle QPR = 65^0$

....drvsr

Question. 36.

The sum of first 31 terms of an arithmetic sequence is 620.

(a) What is its 16^{th} term ?

(b) What is the sum of 15^{th} and 17^{th} terms ?

(c) Find the sum of first and 31^{st} terms.

Solution.

Given, sum of the first 31^{st} term = 620.

a) 16^{th} term (x_{16}) = Sum/N

= 620/31=20.

b) Sum of the 15^{th} and 17^{th} term

$= 2 \times x_{16} = 2 \times 20 = 40$..

c). Sum of first and 31^{st} term

$x_1 + x_{31} = 40$.

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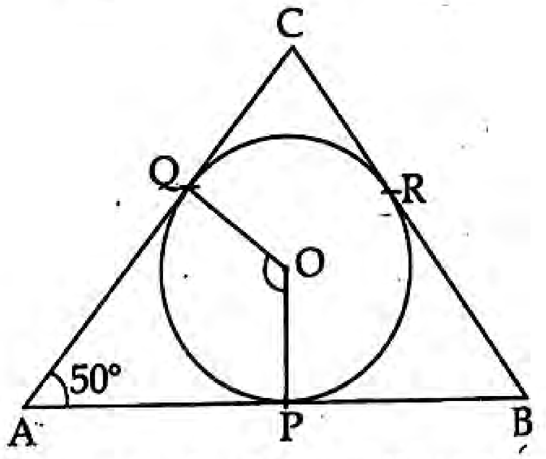
Question. 37.

The circle touches the sides of triangle ABC at P, Q and R, $\angle A = 50°$. What is $\angle POQ$?

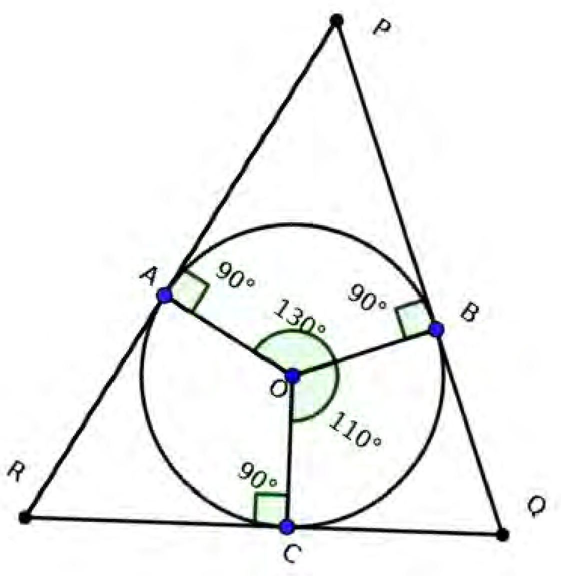


Draw a circle of radius 2 centimetres. Draw the triangle with two angles 50° and 70° and all its sides as tangents to this circle.

Solution .

a) $\angle POQ = 180 - 50 = 130^0$.

b)



Construction

Draw a circle with radius 3cm O as the center. Makes an angle AOB = 130 (180 – 50). And also makes ∠BOC = 110 (180 – 70). Draw tangents throw A,B and C.

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Question. 38.

The diameters of two spheres are in the ratio 2 : 3.

(a) What is the ratio of their radii ?

(b) Find the ratio of their surface areas.

(c) If the surface area of the first sphere is 16π square centimetres. Find the surface area of the second sphere.

Solution .

Given, the ratio of diameter

= 2 : 3.

a) Ratio of radius also be **2:3.**

b). Ratio of surface area

$3\pi r^2 : 3\pi r^2$

$= 4\pi \times 2^2 : 4\pi \times 3^2$

= 4:9.

c) TSA of the first sphere $= 16\pi$

TSA of the second sphere =

$$16\pi \times \frac{9}{4} = 36\pi \text{ cm}^3 .$$

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Question. 39.

The following table shows the students in a class sorted according to their heights.

Height (centimetres)	Number of Students	
130 - 140	9	9
140 - 150	10	19
150 - 160	10	29
160 - 170	9	38
170 - 180	7	45
Total	45	

(a) If the students are arranged in the increasing order of their heights, student at what position will be in the middle ?

(b) What is assumed to be the height of the 20^{th} student ?

(c) Find the median height.

Solution .

Height	Frequency	cf
130-140	9	9
140-150	10	19 (F)
150-160 (Median class)	10 (f)	29 $\frac{N}{2}$
160-170	9	38
170-180	7	45
Total	45	

a) Position of the child with

median height = $\frac{n+1}{2}$

$$= \frac{45+1}{2} = 23.$$

b) The assumed height of the 20^{th} student

$$\frac{N}{2} = \frac{45}{2} = 22.5.,$$

Median class 150-160 ,

$l_1 = 150$

$C = 10$, $F = 19$, $f = 10$.

The assumed height of the

$$20^{th} \text{ student} = \frac{150+151}{2}$$

$$= \frac{301}{2} = 150.5.$$

c) Median height $l_1 + \dfrac{\left(\dfrac{N}{2} - F\right)C}{f}$

$$= 150 + \frac{22.5 - 19}{10} \times 10$$

$= 150 + 3.5 = 153.5$cm.

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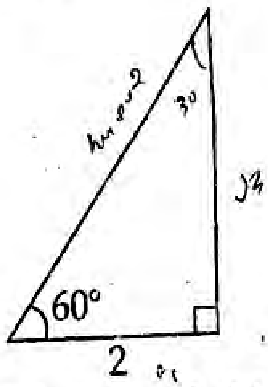
Question. 40.

(a) The figure shows a ladder leaning against a wall. It makes an angle 60° with the floor. The foot of the ladder is 2 metres away from the wall. Find the length of the ladder.



(b) If the same ladder is kept such that the angle with the floor is 30°, how high will its top be from the floor? How far is the foot of the ladder from the wall?

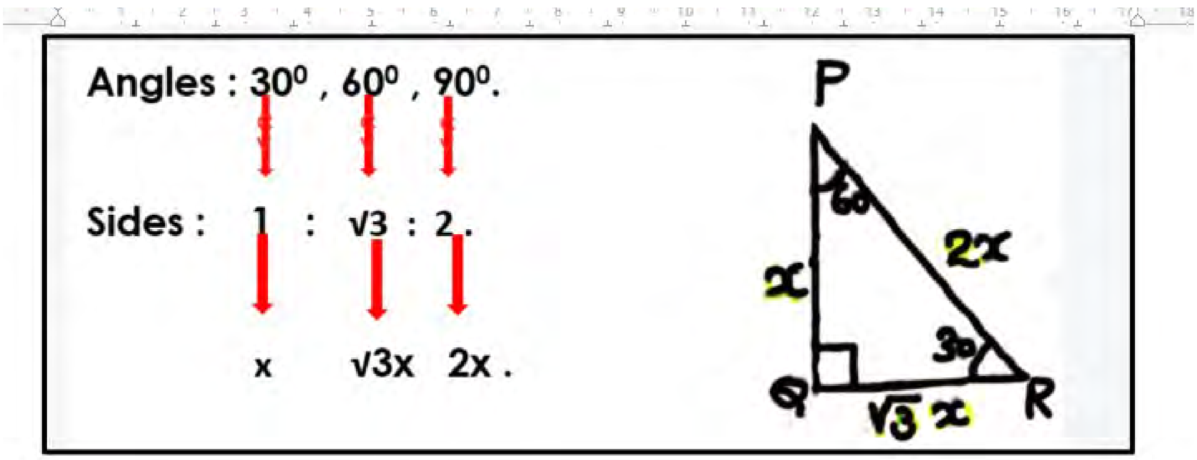
Solution .

Given triangle be a rt. triangle.

ie.,30^0 , 60^0 , 90^0 .

$1 : \sqrt{3} : 2$

[see the question figure]

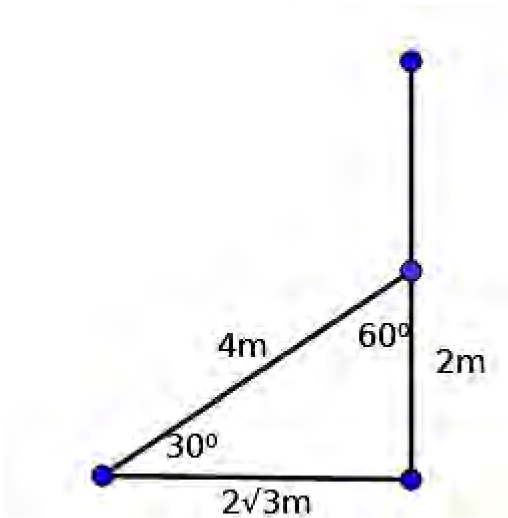


a) Length of the laser

= 2 × 2 = **4m.**

b). Height = **2m.**

Distance = **2√3m.**



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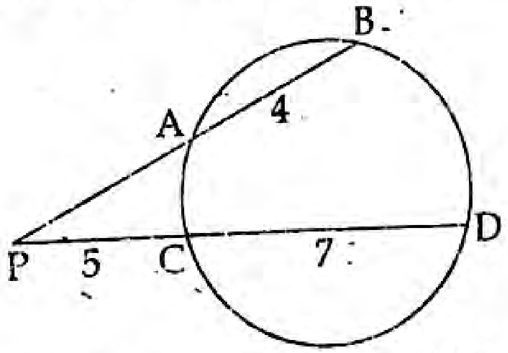
Question. 41.

In the figure, the chords AB and CD are extended to meet at P. AB = 4 centimetres, PC = 5 centimetres, CD = 7 centimetres.



(a) What is the length of PD ?
(b) If the length of PA is taken as x, then what is the length of PB ?
(c) Form a second degree equation in x and find the length of PA.

Solution

a) Length of PD = PC + CD

= 5 + 7 = 12.

b) By given condition

PB = x + 4.

c) We know thay

PA x PB = PC x PD

ie., x(x + 4) = 5 x 12

$x^2 + 4x = 60$

(using square completion method)

$x^2 + 4x + 4 = 60 + 4$

$(x + 2) 2 = 64$

$x + 2 = \sqrt{64} = 8$

$x = 8 - 2 = 6$ cm

PA = 6 cm.

....drvsr

Question. 42.

The coordinates of the end points of a diameter of a circle are (3, 4) and (−3, −4).

(a) Write the coordinates of the centre of the circle.

(b) What is the radius of the circle ?

(c) Write the equation of this circle.

Solution.

a). Center of the circle

Find the mid point

$$\frac{x_1+x_2}{2}, \frac{y+y_2}{2} = \frac{3-3}{2}, \frac{4+4}{2}$$

$$= (0,0).$$

b). Radius of the circle= distance between (0,0) and (3,4)

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

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

c). Equation of the circle

$$x^2 + y^2 = r^2$$

$$x^2 + y^2 = 5^2$$

$$x^2 + y^2 = 25.$$

....drvsr

Question. 43.

The base radius and height of a cylindrical block of wood are 8 centimetres and 15 centimetres. A cone of maximum size is carved out of this.

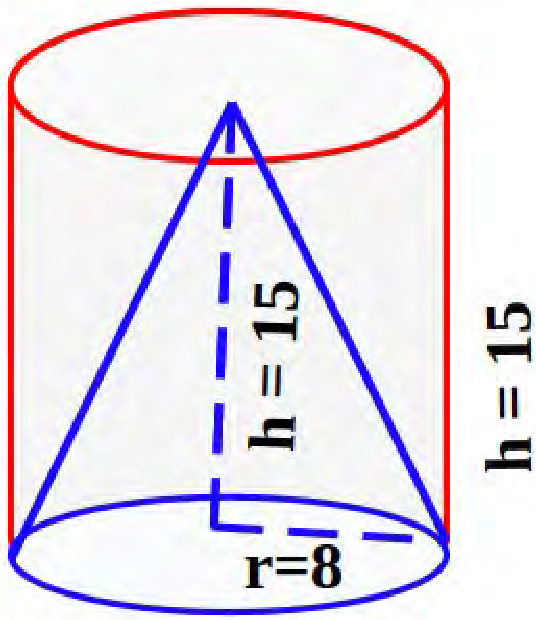
(a) What are the radius and height of the cone ?

(b) Find its slant height.

(c) Find the curved surface area of this cone.

Solution.

Radius = 8cm; height = 15cm.



a) Radius = 8cm

Height = 15cm

b) Slant height

$$l = \sqrt{h^2+r^2}$$

$$= \sqrt{15^2+8^2}$$

$$= \sqrt{225+64} = \sqrt{289} = 17\text{cm}$$

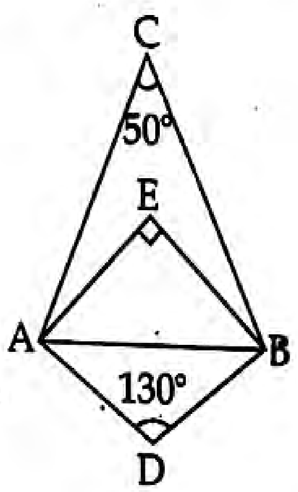
c). CSA of the cone = πrl.

$= \pi \times 8 \times 17 = 136\pi cm^2$.

....drvsr

Question. 44.

In the figure, $\angle AEB = 90°$, $\angle C = 50°$, $\angle D = 130°$.



(a) If a circle is drawn with AB as diameter, where is the position of E ?

(Outside the circle ; on the circle ; inside the circle)

(b) Write the positions of the points C and D with respect to this circle.

(c) Is it possible to draw a circle through the four points A, B, C and D ? Why ?

Solution.

Given, $\angle AEB = 90^0$, $\angle C = 50^0$

$\angle D = 130^0$.

a) E On the circle.

[$\because 90^0$ semicircle]

b) D inside the circle [$\because > 90$)

C out side the circle.[$\because < 90$]

c) Yes,

ABCD be cyclic quadrilateral

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Question. 45.

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

Let us examine the natural numbers, which are powers of 2.

Powers of 2	Digit in the ones place
$2^1 = 2$	2
$2^2 = 4$	4
$2^3 = 8$	8
$2^4 = 16$	6
$2^5 = 32$	2
$2^6 = 64$	4
$2^7 = 128$	8
$2^8 = 256$	6

(a) Which of the following cannot be the digit in the ones place of a power of 2 ?

[2, 3, 4, 6]

(b) Which of the following is the ones place digit in 2^9 ?

[2, 3, 4, 6]

(c) What is the ones place digit in 2^{100} ?

[2, 4, 6, 8]

(d) The ones place digit of 2^n is 6. Then the number n can be :

[12, 13, 14, 15]

(e) $m + n = 26$, then what is the ones place digit of $2^m \times 2^n$?

[2, 8, 4, 6]

Solution.

a) 3   b) 2 ,   c) 6 ,
d) 12   e) 4 .

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SSLC Model Examination March 2021

Mathematics – English Version.

Detailed Solutions with Questions.

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