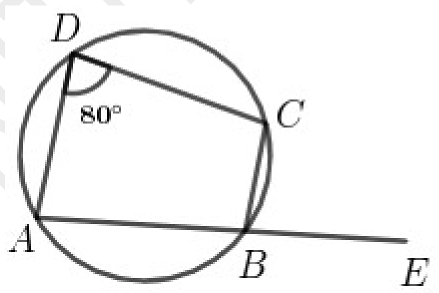
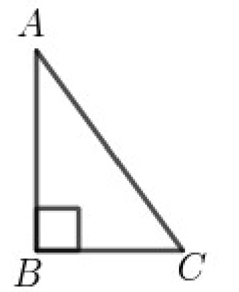
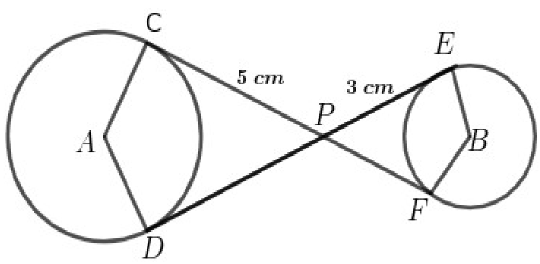
WANDOOR GANITHAM - S S L C MODEL QUESTION PAPER 2021

PREM1 **DETAILED ANSWER KEY - QUESTION PAPER 1**

Qn no.	Key
	For questions from 1 to 5 one score each .
1	**What is the algebraic form of the arithmetic sequence 5 , 8 , 11 , ... ?** **(2 n + 3 , 3 n + 2 , 4 n + 1 , 5n)**
	<u>Answer .</u> **d n + f - d = 3 n + 5 – 3 = 3 n + 2**
2	**In the figure < ADC = 80^0 .What is the measure of < CBE ?.**  **(100^0 , 90^0 , 80^0 , 50^0)**
	<u>Answer .</u> **{ < CBA = 180 – 80 = 100^0 (opposite angles of a cyclic quadrilateral are supplementary) }** **< CBE = 180 – 100 = 80^0 (linear pair)**
3	**What number is to be added to x^2+20x to get a perfect square ?** **(400 , 100 , 144 , 64)**
	<u>Answer .</u> **100** { $x^2+20x+10^2=(x+10)^2$ }
4	**In triangle ABC , <B = 90^0 , sin A = $\frac{3}{5}$, then cos C = ...**  ($\frac{4}{5}$, $\frac{3}{4}$, $\frac{4}{3}$, $\frac{3}{5}$)

	Answer . **sin A =** $\frac{opposite\ side\ of <A}{hypotenuse} = \frac{BC}{AC} = \frac{3}{5}$ **==> cos C =** $\frac{adjacent\ side\ of <C}{hypotenuse} = \frac{BC}{AC} = \frac{3}{5}$
5	**What are the coordinates of the midpoint of the line joining the points (1 , 2) , (5 , 8)** **((6 , 8) , (8 , 6) , (3 , 5) , (4 , 3))**
	Answer . $(\frac{1+5}{2}, \frac{2+8}{2}) = (\frac{6}{2}, \frac{10}{2}) = (3{,}5)$
For questions from 6 to 10 carries 2 scores each .	
6	**Fifth term of an arithmetic sequence is 21 and its ninth term is 37 .** **a) What is its common difference ?** **b) What is its first term ?**
	Answer . **a)** $common\ difference = \frac{term\ difference}{position\ difference} = \frac{37-21}{9-5} = \frac{16}{4} = 4$ **b)** $First\ term = x_5 - 4 \times d = 21 - 4 \times 4 = 21 - 16 = 5$ **{ or** $First\ term = x_9 - 8 \times d = 37 - 8 \times 4 = 37 - 32 = 5$ **}**
7	**In the figure ,A and B are the centres of the circles and tangents are drawn from a point P to the circles . PC = 5 cm , PE = 3 cm** **a) What is the length of PD ?** **b) What is the length of CF ?** 
	Answer . **a) PD = 5 cm . (PC = PD , The tangents to a circle from a point are of the same length)** **b) CF = PC + PF = 5 + 3 = 8 cm . (PE =PF = 3 cm)**

8 **The base radius and height of a cone are 9 centimetres and 12 centimetres .**

a) What is its slant height ?

b) What is its curved surface area ?

Answer .

a) Slant height = $\sqrt{r^2+h^2}=\sqrt{9^2+12^2}=\sqrt{81+144}=\sqrt{225}=15 \ cm$

b) Curved surface area = $\pi \times r \times l \ = \ \pi \times 9 \times 15 \ = \ 135\pi \ sq.cm$

9 **A circle of radius 5 is drawn with origin as centre.**

a) Write down the coordinates of a point at which the circle cuts the x -axis ?

b) If (p , q) is a point on this circle , prove that $p^2 + q^2 = 25$ **.**

Answer .

a) (5 , 0) or (- 5 , 0)

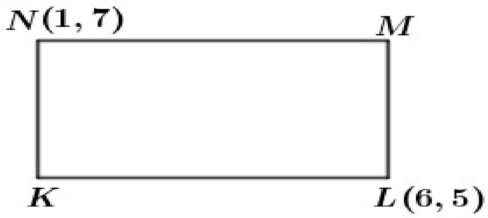
b) Radius = 5 ==.> $\sqrt{(p-0)^2+(q-0)^2}=5$ ==> $\sqrt{p^2+q^2}=5$

$p^2+q^2 \ = \ 5^2 \ = \ 25$

10 **In the figure sides of the rectangle KLMN are parallel to the axes .**

a)What are the coordinates of K ?

b)What are the coordinates of M ?



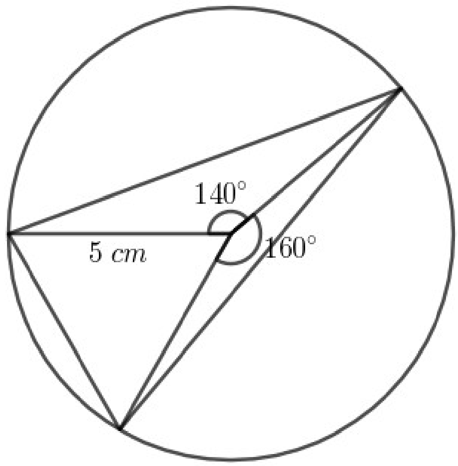
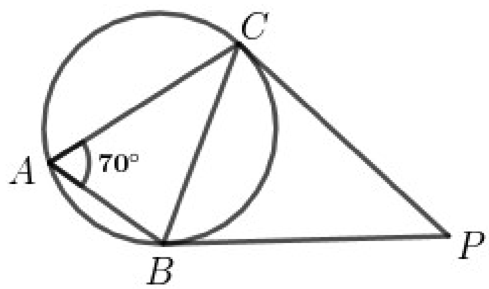
Answer .

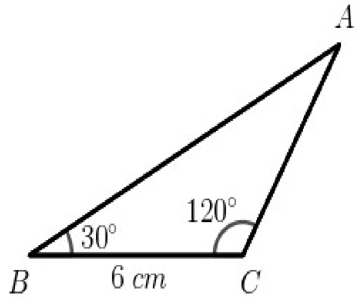
a) Coordinates of K = (1 , 5)

b) Coordinates of M = (6 , 7)

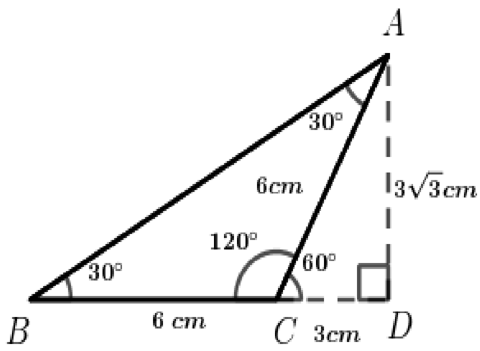
For questions from 11 to 20 carries 3 scores each .

11 **Draw a triangle of circumradius 5 cm and two of the angles** 70^0 **and** 80^0 **.**

	
12	**Consider the arithmetic sequence 8 , 15 , 22 , ...** **a) What is its common difference ?** **b) What is its sixth term ?** **c)What is the sum of first 11 terms of this sequence ?**
	<u>Answer .</u> **a) Common difference =** $15-8=7$ **b) Sixth term =** $8 + 5\times 7 = 8 + 35 = 43$ **c) Sum of first 11 terms =** $11\times midterm = 11\times x_6 = 11\times 43 = 473$
13	**In the figure , tangents through the points B and C intersect at P . < BAC = 70^0** **a) What is the measure of < PBC ?** **b) What is the measure of < BPC ?** 
	<u>Answer .</u> **a) < PBC = 70^0 (In a circle , the angle which a chord makes with the tangent at one end on any side is equal to the angle which it makes on the part of the circle on the other side)** **b) < PBC = < PCB = 70^0 (PB = PC)** **< BPC = 180 - (70 + 70) = 180 – 140 = 40^0 .**

14	**A dice with faces numbered from 1 to 6 is rolled .** **a) What is the probability of getting an even number ?** **b) What is the probability of getting an odd number ?** **c) What is the probability of getting a perfect square ?**
	<u>Answer .</u> **a) Probability of getting an even number =** $\frac{Number\ of\ favourable\ results}{Total\ number\ of\ results}$ $= \frac{3}{6}$ **b) Probability of getting an odd number =** $\frac{3}{6}$ **c) Probability of getting a perfect square =** $\frac{2}{6}$ **{ Favourable results == > a) (2 , 4 , 6) b) (1 , 3 , 5) c) (1 , 4) }**
15	**When each side of a square was increased by 4 metres , the area became 256 square - metres .** **a) Write down a second degree equation by taking the side of the original square as x** **b) What was the length of a side of the original square ?**
	<u>Answer .</u> **a)** $(x+4)^2 = 256$ **b)** $x+4 = \sqrt{256} = 16$ $x = 16-4=12$ **==> side of the original square = 12 m**
16	**In triangle** ABC **,** $<B=30^\circ, <C=120^\circ, BC=6\,cm$ **a)What is the measure of** $<A$ **?** **b)What is the perpendicular distance from A to the side BC** **c) What is the area of the triangle ?** 

Answer .



a) $<A = 180 - (30+120) \;=\; 180 - 150 \;=\; 30^0$

b) ABC is an isosceles triangle .

So BC = AC = 6 cm .

Draw the perpendicular from A to the side BC .

In triangle ACD , $AD = 3\sqrt{3}\;\; cm$

c) Area of the triangle ABC = $\frac{1}{2} \times BC \times AD = \frac{1}{2} \times 6 \times 3\sqrt{3} = 9\sqrt{3} \;\; sq.cm$

17 **If** $p(x) = x^2 - 8x + 15$

a) Find $p(3)$ **?**

b) Check whether $x-5$ **is a factor of** $p(x)$ **or not ?**

c) Write $p(x)$ **as the product of two first degree polynomials ?**

Answer .

a) $p(3) = 3^2 - 8 \times 3 + 15 \;=\; 9 - 24 + 15 = 24 - 24 \;=\; 0$

b) $p(5) = 5^2 - 8 \times 5 + 15 \;=\; 25 - 40 + 15 = 40 - 40 \;=\; 0$ **==>** $x-5$ **is a factor .**

c) $p(x) \;=\; (x-3)(x-5)$

18 **The marks obtained by 9 students in a maths exam are given below .**

68 , 72 , 76 , 62 , 70 , 64 , 60 , 74 , 66

a) What is the mean mark ? .

b) What is the median mark .

Answer .

a) $Mean \;=\; \frac{60+62+64+66+68+70+72+74+76}{9} \;=\; \frac{612}{9} \;=\; 68$

b) $60 \;,\; 62 \;,\; 64 \;,\; 66 \;,\; 68 \;,\; 70 \;,\; 72 \;,\; 74 \;,\; 76$

$Median = 68$

19 **The base radii of two cones are in the ratio 3 : 4 and their slant heights are in the ratio 5 : 6**

a) If the base radius of the first cone is taken as 3 r , what will be the base radius of the second cone ?

b) What is the ratio of their curved surface areas ?

c) If the curved surface area of the first cone is 180π **square centimetres , what will be the curved surface area of the second cone ?**

<u>Answer .</u>

a) $r_1=3r$ ==> $r_2=4r$

b) $l_1=5l$ ==> $l_2=6l$

Ratio of the curved surface areas = $\pi\times3r\times5l : \pi\times4r\times6l=15:24$

c) Curved surface area of the second cone = $\frac{24\times180}{15}$ = 288π $sq.cm$

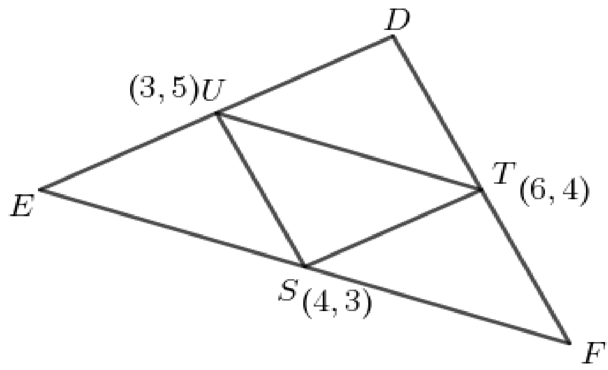
20 **In the figure S , T , U are the midpoints of the sides of the triangle DEF**

S (4 , 3) , T (6 , 4) , U (3 , 5)

a)What are the coordinates of E ?

b)What are the coordinates of F ?

c)What are the coordinates of D ?



<u>Answer .</u>

a) $(3+4-6 \ , \ 5+3-4) = (1,4)$ **(ESTU is a parallelogram)**

b) $(4+6-3 \ , \ 3+4-5) = (7,2)$ **(SFTU is a parallelogram)**

c) $(3+6-4 \ , \ 5+4-3) = (5,6)$ **(STDU is a parallelogram)**

For questions from 21 to 30 carries 4 scores each .

21 **Compute the following sums .**

a) $1 + 2 + 3 + 4 + 5 + \dots\dots\dots + 20$

b) $4 + 8 + 12 + 16 + 20 + \dots\dots\dots + 80$

c) $5 + 9 + 13 + 17 + 21 + \dots\dots\dots + 81$

d) $9 + 17 + 25 + 33 + 41 + \dots\dots\dots + 161$

Answer .

a) $1 + 2 + 3 + 4 + 5 + \dots\dots\dots + 20 = \frac{20 \times 21}{2} = 210$

b) $4 + 8 + 12 + 16 + 20 + \dots\dots\dots + 80 = 4 \times 210 = 840$

c) $5 + 9 + 13 + 17 + 21 + \dots\dots\dots + 81 = 840+20 \times 1 = 840+20 = 860$

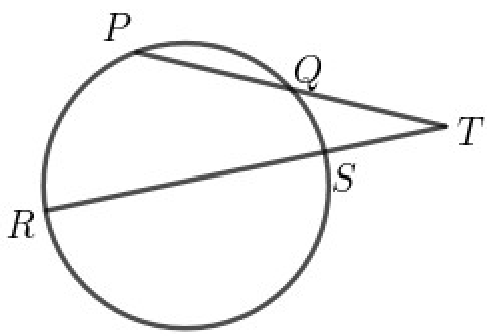
d) $9 + 17 + 25 + 33 + 41 + \dots\dots\dots + 161 = 840+860 = 1700$

22 **In the figure ,chords PQ and RS are extended to meet at T. RT = 18 cm ,RS = 14 cm Q is the midpoint of PT .**

a) What is the length of TS ?

b) TP x TQ =

c) What is the length of PQ



Answer .

a) $TS = 18 - 14 = 4 \; cm$

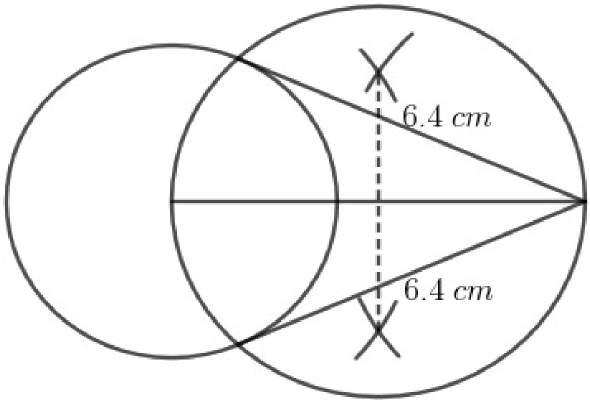
b) $TP \times TQ = TR \times TS = 18 \times 4 = 72$

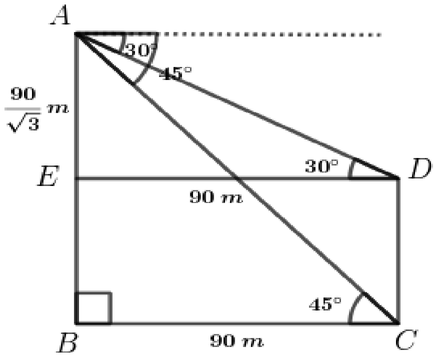
c) $TQ = PQ$ $\quad (Q \text{ is the mid point of } PT)$

$2TQ \times TQ = 72$

$TQ^2 = \frac{72}{2} = 36 \quad ==> \quad TQ = \sqrt{36} = 6$

$PQ = 6 \; cm$

23	**Draw a circle of radius 3 cm and mark a point 7 cm away from its centre.** **Draw the tangents to the circle from this point . Measure the length of the tangents .**	
		
24	**One is asked to say a two -digit number .** **a) How many two digit numbers are there ?** **b) What is the smallest possible product of the digits ?** **c) What is the largest possible product of the digits ?** **d) What is the probability of the product of the digits being a perfect square ?**	
	<u>Answer .</u> **a) 90** **b) 0** **c) 81** **d) Favourable results = 11 , 14 , 22 , 41 , 19 , 33 , 91 , 28 , 44 , 82 , 55 , 49 , 66 , 94 , 77 , 88 , 99** **Probability of the product of the digits being a perfect square** = $\frac{\textit{Number of favourable results}}{\textit{Number of total results}}$ $= \frac{17}{90}$	

25	**The longer side of a rectangle is 4 centimetres more than its shorter side . The area of the rectangle is 672 square centimetres .** **a) Write down a second degree equation by taking the shorter side as x** **b) What are the lengths of its the sides ?**
	<u>Answer .</u> **a) Shorter side =** x **Longer side =** $x+4$ $(x+4)x = 672$ ==> $x^2+4x = 672$ **b)** $x^2+4x +2^2= 672+2^2$ $(x+2)^2 = 672+4=676$ $x+2 = \sqrt{676}=26$ $x = 26-2 = 24$ **Shorter side =** $x= 24cm$ **Longer side =** $x+4 = 24+4 = 28\ cm$
26	**A man standing on the top of a building sees the base of a tower at a depression of 45^0 and its top at a depression of 30^0 . The distance between the building and tower is 90 metres .** **a) Draw a rough figure based on the given details ?** **b) What is the height of the building ?** **c) What is the height of the tower ?**
	<u>Answer .</u>  **Height of the building = CD** **Height of the tower = AB**

	b) In triangle ABC , $AB = BC = 90\ m$ $\quad (AB : BC : AC := 1 : 1 : \sqrt{2})$ **Height of the tower =** $AB = 90\ m$ **c) In triangle AED ,** $DE = 90\ m$ **==>** $AE = \frac{90}{\sqrt{3}}\ m$ $\quad (AE : DE : AD := 1 : \sqrt{3} : 2)$ **Height of the building =** $CD = BE = AB - AE = 90 - \frac{90}{\sqrt{3}}\ m$
27	**If** $p(x) = x^2 + 3x + 2$ **a) Find** $p(1)$ **?** **b) Write a factor of** $p(x) - p(1)$ **?** **c) Write** $p(x) - p(1)$ **as the product of two first degree polynomials ?**
	<u>Answer .</u> **a)** $p(1) = 1^2 + 3 \times 1 + 2 = 1 + 3 + 2 = 6$ **b)** $(x - 1)$ **c)** $p(x) - p(1) = x^2 + 3x + 2 - 6 = x^2 + 3x - 4$ $x^2 + 3x - 4 = (x-1)(x+4)$
28	**55 households in a neighbourhood are sorted according to their monthly income in the table below .**

Monthly income (Rs)	Number of households
4000	6
5000	9
6000	10
7000	9
8000	8
9000	7
10000	6

	a) If the households are arranged in increasing order of monthly income , what is the monthly income of the household at the 26th position ? **b) If the households are arranged in increasing order of monthly income , the monthly income of the household at what position is taken as the median ?** **c) Find the median of the monthly income ?**
	<u>Answer .</u>

Monthly income	Number of households
Up to 4000	6
Up to 5000	15
Up to 6000	25
Up to 7000	34
Up to 8000	42
Up to 9000	49
Up to 10000	55

a) Monthly income of the 26th household = Rs 7000

b) $N=55$

$$\frac{N+1}{2}=\frac{55+1}{2}=\frac{56}{2}=28$$

Median = Monthly income of the 28th household .

c) median monthly income = Rs 7000

29 **A sector of area** 100π **square centimetres is rolled up into a cone of base radius 5 centimetres .**

a) What is curved surface area of the cone ?

b) What is the slant height of the cone ?

c) What is the radius of the sector ?

d) What is the central angle of the sector ?

<u>Answer .</u>

a) curved surface area of the cone = Area of the sector = $100\pi\ sq.cm$

b) $\pi \times r \times l = 100\pi$ ==> $\pi \times 5 \times l = 100\pi$ ==> $l = \dfrac{100\pi}{5\pi} = 20$

Slant height of the cone = $20\ cm$

c) Radius of the sector = Slant height of the cone = $20\ cm$

d) $\dfrac{x}{360} = \dfrac{r}{R}$ == > $\dfrac{x}{360} = \dfrac{5}{20}$ ==> $x = \dfrac{5 \times 360}{20} = 90^0$

Central angle of the sector = 90^0

30 **The vertices of a triangle are A (1 , 9) , B (4 , 6) , C(3, 11)**

a) What is the length of AB ?

b) What is the length of BC ?

c) Prove that ABC is a right triangle ?

<u>Answer .</u>

a) $AB = \sqrt{(4-1)^2 + (6-9)^2} = \sqrt{3^2 + (-3)^2} = \sqrt{9+9} = \sqrt{18}$

b) $BC = \sqrt{(3-4)^2 + (11-6)^2} = \sqrt{(-1)^2 + 5^2} = \sqrt{1+25} = \sqrt{26}$

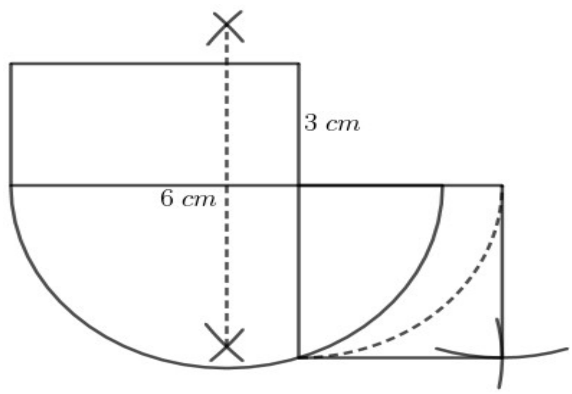
c) $AC = \sqrt{(3-1)^2 + (11-9)^2} = \sqrt{2^2 + 2^2} = \sqrt{4+4} = \sqrt{8}$

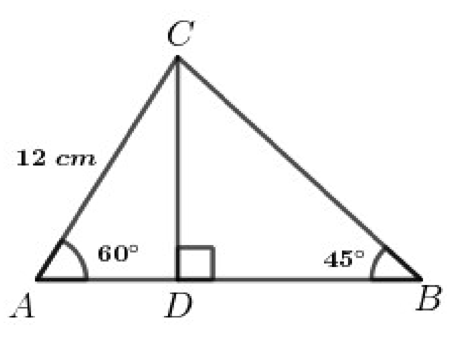
$AB^2 + AC^2 = (\sqrt{18})^2 + (\sqrt{8})^2 = 18 + 8 = 26 = (\sqrt{26})^2 = BC^2$

So ABC is a right triangle .

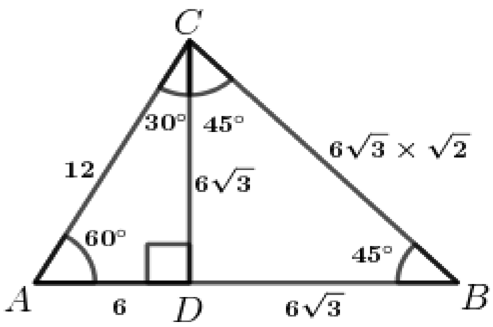
For questions from 31 to 45 carries 5 scores each .

31 **Draw a rectangle of width 6 cm and height 3 cm . Draw a square of the same area .**



32	**Look at the number pattern given below.** **1** **2 3** **4 5 6** **7 8 9 10** **.....................................** **...** **a) Write down the next two more lines of this pattern ?** **b) How many numbers are there in the 20 th line ?** **c) What is the last number in the 19 th line ?** **d) What is the first number in the 20 th line ?**
	<u>Answer .</u> **a) 11 12 13 14 15** **16 17 18 19 20 21** **b) 20** **c)** $\frac{19\times 20}{2}=190$ **d) 190 + 1 = 191**
33	**In the figure** $AC=12\,cm, <A=60^0, <B=45^0$ **The line** CD **is perpendicular to the side** AB **.**  **a) What is the measure of** $<ACB$ **?** **b) What is the length of** CD **?** **c) What is the area of triangle** ABC **?** **d)What is the ratio of the length of the sides if the ratio of angles of a triangle is 3:4:5**

<u>Answer .</u>



a) $< ACB = 30 + 45 = 75^0$

b) $CD = 6\sqrt{3}\ \ cm$

c) Area of the triangle ABC = $\frac{1}{2} \times AB \times CD$

= $\frac{1}{2} \times (6+6\sqrt{3}) \times 6\sqrt{3}\ \ sq.cm$

d) Ratio of the angles = $3:4:5$

Angles = $180 \times \frac{3}{12}$, $180 \times \frac{4}{12}$, $180 \times \frac{5}{12}$ = 45^0 , 60^0 , 75^0

Ratio of the sides = $12 : 6\sqrt{6} : 6\sqrt{3}+6$ = $2 : \sqrt{6} : \sqrt{3}+1$

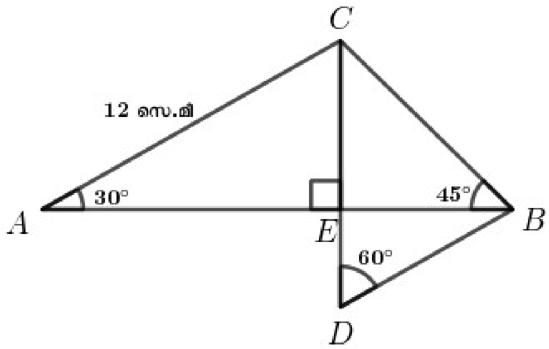
34 **In the figure** $< BAC = 30^\circ, < ABC = 45^\circ$, $< AEC = 90^\circ, < BDE = 60^\circ, AC = 12\,cm$

a) What is the length of CE **?**

b) What is the length of BE **?**

c) What is the length of AB **?**

d) What is the area of the triangle BCD **?**



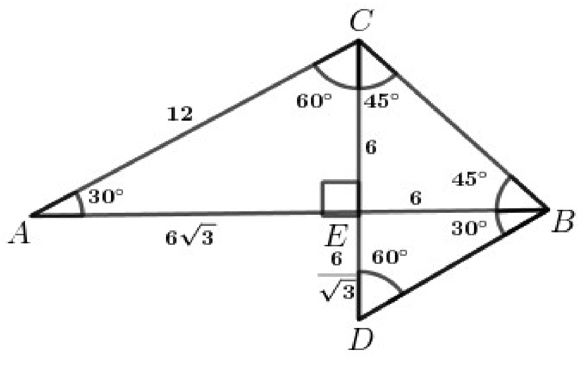
<u>Answer .</u>

a) $CE = 6\ cm$

b) $BE = 6\ cm$

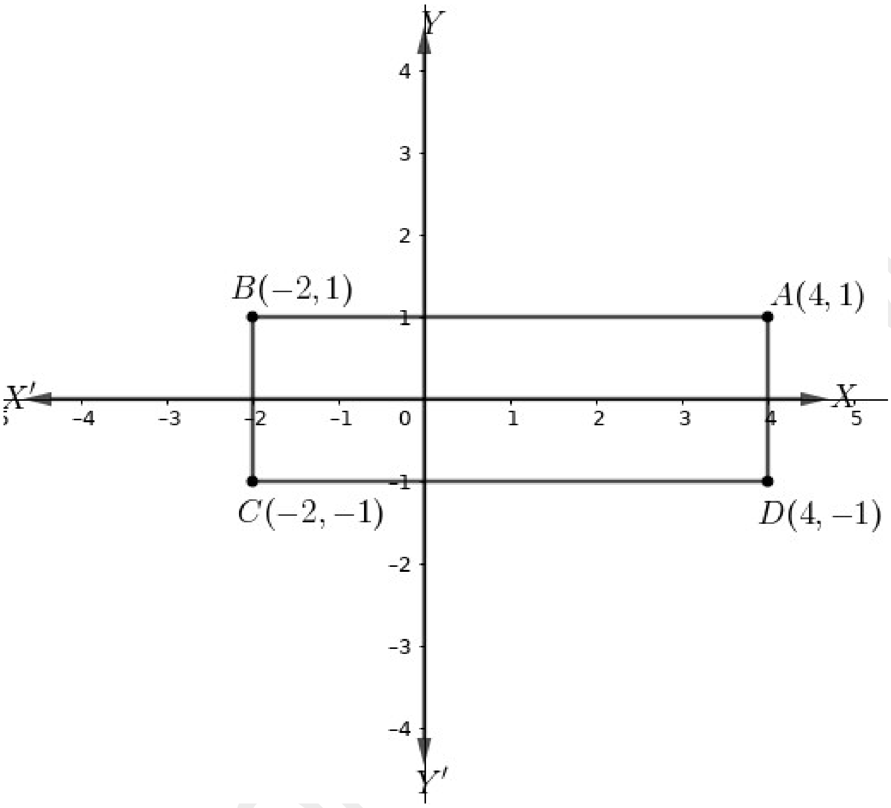
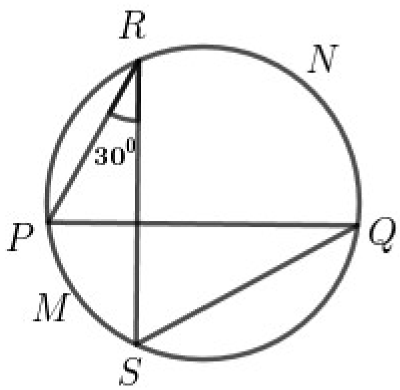
c) $AB = 6\sqrt{3}+6\ cm$

d) $CD = 6 + \frac{6}{\sqrt{3}}\ cm$



Area of the triangle BCD = $\frac{1}{2} \times CD \times BE$ = $\frac{1}{2} \times (6 + \frac{6}{\sqrt{3}}) \times 6\ sq.cm$

35	**If** $x^2+3x-18=(x-a)(x-b)$ **a) What is the value of** $a+b$ **?** **b) What is the value of** ab **?** **c) Write** $x^2+3x-18$ **as the product of two first degree polynomials ?**
	<u>Answer .</u> **a)** $a+b=-3$ **b)** $ab=-18$ **c)** $a=-6$ $b=3$ $x^2+3x-18 = (x+6)(x-3)$
36	**Consider the arithmetic sequence 63 , 58 , 53 , ...** **a) What is its common difference ?** **b) What is the remainder when each positive term of this sequence is divided by 5 ?** **c) Which is the smallest positive number in this sequence ?** **d) What is its algebraic form ?** **e) How many positive numbers are there in this sequence ?**
	<u>Answer .</u> **a)** -5 **b)** 3 **c)** 3 **d)** $dn+f-d = -5n+63-(-5) = -5n+68$ **e)** $x_n=3 \rightarrow -5n+68=3 \rightarrow 5n=65 \rightarrow n=\frac{65}{5}=13$

37	**a) Draw the axes and mark the following points A(4 ,1) ,B (-2 ,1) , C(-2 , - 1)** **D (4 , - 1) .** **b) Write the most suitable name of the quadrilateral ABCD ?**
	<u>Answer .</u> **a)**  **b) Rectangle**
38	**In the figure the chords PQ and RS are perpendicular to each other . < PRS = 30 ^{0}** **a) What is the measure of < PQS ?** **b) What is the central angle of the arc PMS ?** **c) What is the sum of the central angles of the arcs PMS and RNQ ?** 
	<u>Answer .</u> **a)** $\angle PQS = \angle PRS = 30^{0}$ **(All angles made by an arc on the alternate arc are equal)** **b)Central angle of the arc PMS =** $2 \times \angle PRS \ = \ 2 \times 30 \ = \ 60^{0}$ **(The central angle of an arc is double the angle made by it on the alternate arc)**

c) $\angle RPQ = \angle RSQ = 60^0$

Central angle of the arc RNQ = $2 \times \angle RPQ = 2 \times 60^0 = 120^0$

Sum of the central angles of the arcs PMS and RNQ = $60^0 + 120^0 = 180^0$

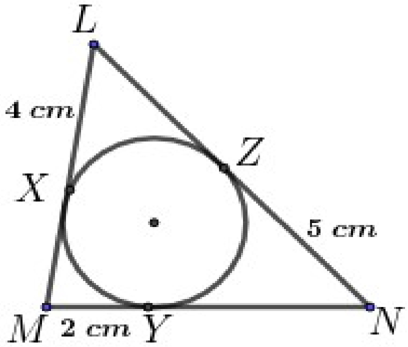
39 **In the figure , the circle touches the sides of the triangle LMN at the points X ,Y , Z**

LX = 4 cm , MY = 2 cm , NZ = 5 cm .

a) What is the length of LZ ?

b) What is the length of MN ?

c) What is the perimeter of the triangle LMN ?



Answer .

a) $LZ = LX = 4 \ cm$ **(The tangents to a circle from a point are of the same length)**

b) $MX = MY = 2 \ cm$

$YN = NZ = 5 \ cm$

$MN = 2 + 5 = 7 \ cm$

c) $LN = 5 + 4 = 9 \ cm$

$LM = 4 + 2 = 6 \ cm$

Perimeter of the triangle LMN = $LM + MN + LN = 6 + 7 + 9 = 22 \ cm$

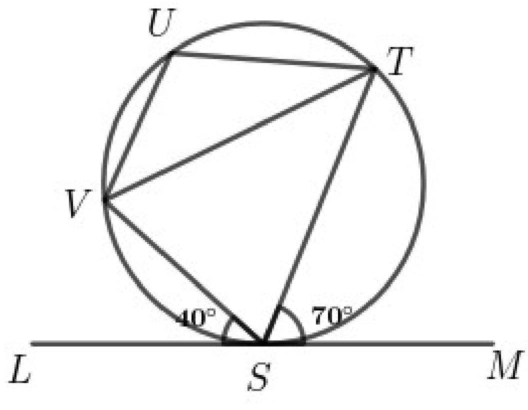
40 **In the figure LM is a tangent . TU = VU**

< LSV = 40⁰ , < TSM = 70⁰

a) What is the measure of < STV ?

b) What is the measure of < SVT ?

c) What is the measure of < TUV ?



Answer .

a) $\angle STV = 40^0$ **(In a circle , the angle which a chord makes with the tangent at one end on any side is equal to the angle which it makes on the part of the circle on the other side)**

b) $\angle SVT = 70^0$

c) $\angle TSV = 180 - 110 = 70^0$ **(Sum of the angles of a triangle is 180^0)**

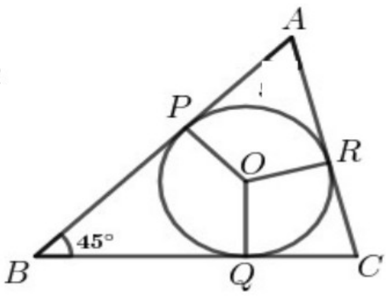
$\angle TUV = 110^0$ **(STUV is cyclic . The opposite angles of a cyclic quadrilateral are supplementary)**

d) $\angle TVU = \frac{180-110}{2} = \frac{70}{2} = 35^0$ $(TU = VU)$

41 **In the figure O is the centre of the incircle . The circle touches the sides of the triangle at the points P , Q and R**

< ABC = 45^0

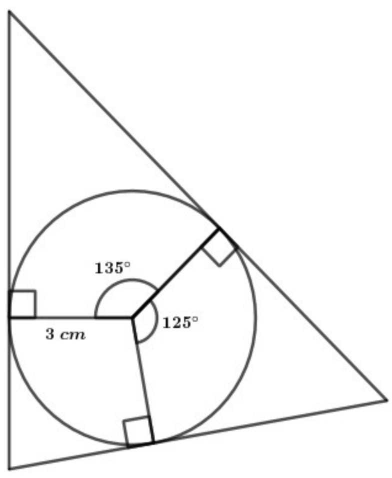
a) What is the measure of < POQ ?



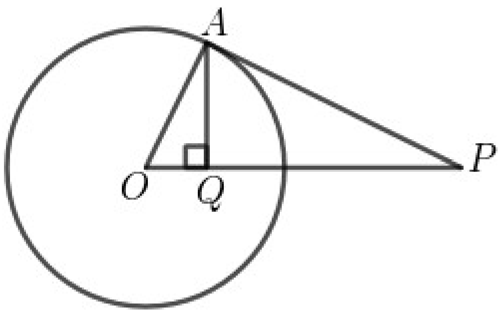
b) Draw a circle of radius 3 cm . Draw a triangle of angles 45^o , 55^o , 80^o with all its sides touching this circle .

Answer .

a) < POQ = 180 – 45 =135^0 (In a circle , the angles between the radii through two points and the angle between the tangents at these points are supplementary)



42 **In th figure , O is the centre of the circle . AP is a tangent . AQ is perpendicular to OP .**



a) What is the measure of < OAP ?

b) Prove that the angles of the triangles OAP and OAQ are same ?

c) Prove that OP x OQ = OA^2 ?

Answer .

A) $\angle OAP = 90^0$ **(The tangent at a point on a circle is perpendicular to the radius through that point)**

b) $\angle OAP = \angle OQA = 90^0$, $\angle AOP = \angle AOQ$, $\angle OPA = \angle OAQ$

c) Since the angles of the triangles OAP and OAQ are equal , their sides taken in the order of size , are in the same ratio

$$\frac{OP}{OA} = \frac{OA}{OQ}$$

$$OP \times OQ = OA \times OA$$

$$OP \times OQ = OA^2$$

43 **A conical fire work is of base perimeter** 10π **centimetres and height 12 centim - etres . 10000 such fire works are to be wrapped in colour paper .The price of the colour paper is 10 rupees per square metre.**

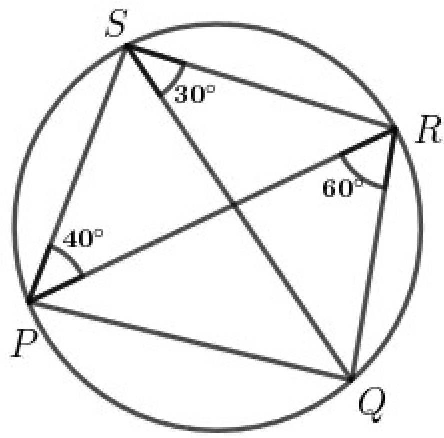
a) What is the base radius of a fire work ?

b) What is the slant height of a fire work ?

c) What is the surface area of a fire work ?

d) What is the total cost ? **(hint :** $\pi = 3.14$ **)**

	Answer . **a) Radius of a fire work =** $\frac{10\pi}{2\pi}=5\,cm$ **b)Slant height of a fire work =** $\sqrt{r^2+h^2}=\sqrt{5^2+12^2}=13\ cm$ **c) Surface area of a fire work =** $\pi\times5^2+\pi\times5\times13=90\,\pi\ sq.cm$ $= \frac{90\pi}{10000}\ sq.m$ **d) Total cost =** $\frac{90\times3.14}{10000}\times10000\times10=\ Rs\ \ 2826$
44	**The vertices of a triangle are A (3 , 5) , B (9 , 13) , C (10 , 6) .** **a) What is the length of the side AB ?** **b) Prove that ABC is an isosceles triangle ?** **c) What are the coordinates of the midpoint of AB ?** **d) What is the area of the triangle ABC ?**
	Answer . **a)** $AB=\sqrt{(9-3)^2+(13-5)^2}=\sqrt{6^2+8^2}=\sqrt{36+64}=\sqrt{100}=10$ **b)** $BC=\sqrt{(10-9)^2+(6-13)^2}=\sqrt{1^2+(-7)^2}=\sqrt{1+49}=\sqrt{50}$ $AC=\sqrt{(10-3)^2+(6-5)^2}=\sqrt{7^2+1^2}=\sqrt{49+1}=\sqrt{50}$ **ABC is an isosceles triangle (BC = AC)** **c) Coordinates of the midpoint of AB =** $(\frac{3+9}{2}\ ,\ \frac{5+13}{2})=(\frac{12}{2},\frac{18}{2})=(6,9)$ **d)Perpendicular distance from C to the side AB =** $h=\sqrt{(6-10)^2+(9-6)^2}=5$ **(The line joining the common vertex of equal sides to the midpoint of its opposite side of an isosceles triangle is perpendicular to that side)** **Area of the triangle ABC =** $\frac{1}{2}\times AB\times h\ =\ \frac{1}{2}\times10\times5=25\ sq.cm$

45	**In the figure < PRQ = 60 ^{0}, < QSR = 30 ^{0}, < RPS = 40 ^{0}** **a) What is the measure of < PSQ ?** **b) What is the measure of < QPR ?** **c) What is the measure of < SQR ?** **d)What is the measure of < PQS ?** **e) What is the measure of < PRS ?**	

<u>Answer .</u>

a) $\angle PSQ = 60^0$ **(All angles made by an arc on the alternate arc are equal)**

b) $\angle QPR = 30^{\ 0}$

c) $\angle SQR = 40^{\ 0}$

d) $\angle PQS = 50^{\ 0}$ **(** $\angle PSR = 60+30=90^{\ 0}$ → $\angle PQR = 90^{\ 0}$

The opposite angles of a cyclic quadrilateral are supplementary)

e) $\angle PRS = 50^{\ 0}$ **(** $\angle QPS = 30+40=70^{\ 0}$ → $\angle QRS = 110^{\ 0}$ **)**