DISTRICT INSTITUTE OF EDUCATION AND TRAINING, PALAKKAD

SSLC PRE-MODEL EXAMINATION 2023

MATHEMATICS-STD. X **MAX.MARK :80**

Answer any three questions from question numbers 1 to 4. Each question carries 2 marks .

1) a) Write an arithmetic sequence of common differene 3.

b) What is the difference between the tenth and fifteenth terms of this sequence?

2)Write $x^2 - \frac{1}{4}$ as the product first degree polynomials.

3)Find the coordinates of the point which divides the line joining the points A(2,5)and B(8,8) in the ratio1:2 .

4) In a circle, chords AB and CD intersect in P .

If AB = 10 , AP = 4 , CP = 8

a)Find AP x PB

b) Find the lenghth of PD .

Answer any 4 questions from question numbers 5 to 10 .Each question carries 3 marks.

5) (a)If the median of the numbers 17, 13, 18,15, x,10, 9 is x ,find the value of x.

(b) If the value of x is 16 ,find the median.

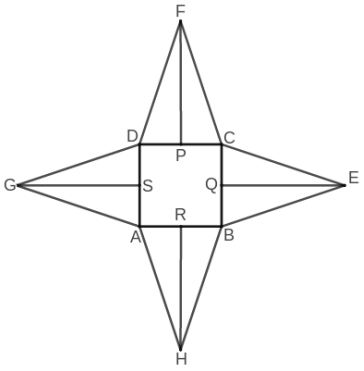
6) In the figure

AB=10cm, CE=13cm , PF = 12cm

a) Name the figure which can be formed by folding this along the base edges.

b)What is the slant height ?

c)what will be the height?



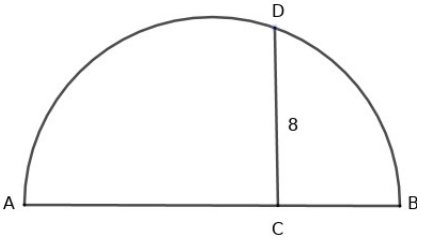
7) The diagonal of a rectangle is 12 cm long.The angle it makes with one side is 35° . Find the perimeter of the rectangle.

[sin 35° = 0.57, cos 35° = 0.82]

8) In the figure AB is the diameter of the semicircle and CD=8 cm . The lenghth of BC is 12cm less than the lenghth of AC

a)If AC = x ,what is the lenghth of BC?

b) What is the radius of the semicircle ?

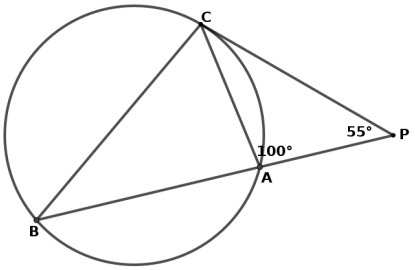


9) In the figure PC is a tangent to the circle

a)Find < PCA

b) Find < CBA

c) Find < BCA



10) In an arithmetic sequence the 5^{th} and 10^{th} terms are 30 and 55 respetively.

a) What is the common difference?

b) Write the sequence.

c) Find the 100^{th} term of this sequence.

Answer any 8 questions from question numbers 11 to 21.Each question carries 4 marks.

11) If $p(x) = x^2-4x+4$

a) Prove that (x-2) is a factor of p(x) .

b) Find the solution of the equation p(x) = 0

12) a) Draw a circle with centre at origin and radius 4cm.

b)Draw a radius OP making an angle 45^o with the X-axis and draw a tangent at P.

c) Find the coordinates of the points A and B where the tangent intersects the axes.

d) Find the length of AB .

13) A solid figure is formed by attaching a hemisphere of radius 9c.m. with the base of a cone of same radius. The total height of the solid figure is 21 cm.

a) What is the height of the cone?

b) What is the volume of the solid figure?

14) A man observes the top of a tower at an angle of elevation 60^o from a point at a fixed distane from the foot of the tower .Then he observes the tower from a point 10m.vertically above the previous position at an angle of elevation 45^o .

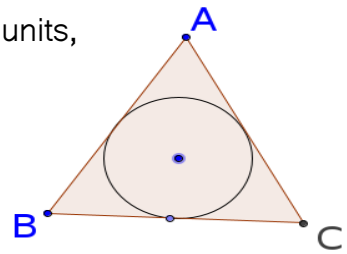
a) Draw a rough sketh.

b) Find the height of the tower and the distance of the man from the tower.

15) The sum of a number and its reciproal is13/6 . Which is the number?

16) a)In the figure triangle ABC is equilqteral.If one side of ABC is 'a'units, find its area.

b) If a dot is put in the figure with eyes closed,what is the probability that it is in the incircle?

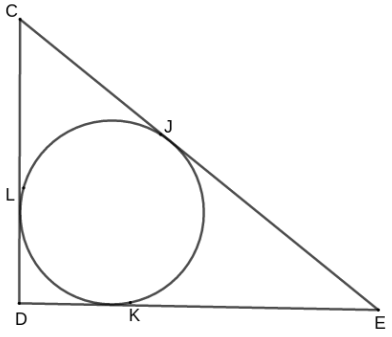


17) In the figure the circle touches the three sides of right triangle CDE .CD = 6 cm , DE = 8cm , DE = 10 cm.

If the length of DK is 'x'

a) Write the length of LD in terms of 'x'.

b)What is the lenghth of LC ?



c)Write the lenghth of CE in terms of x.Find the lenghths of all other lines.

d) What is the radius of the incircle?

18) Find the sum

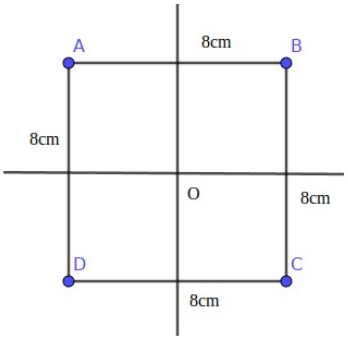
a) 1+2+3+...+10

b) 2+4+6+...+20

c) 3+6+9+...+30

d) 6+12+18+...+60

19) In the figure ABCD is a squre of side 8cm.,O is the origin.



The axes are drawn through the midpoints of the sides of ABCD.

a) Find the coordinates of the vertices of ABCD.

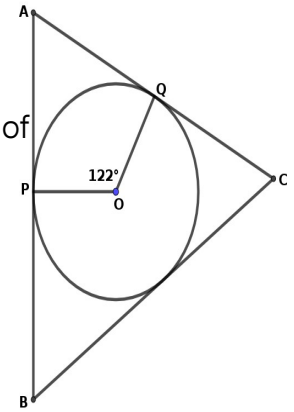
b)Find the coordinates of the points where the sides AD and BC cuts the X-axis.

c)Find the slope of diagonal BD.

20) a) In the figure , O is the incentre.

If <POQ = 122^0 what is the measure of <A ?

b) Draw a triangle with two angles 100°,67° and with radius of the incircle 3cm.



21) The algebraic form of an arithmetic sequence is

4n + 3 .

a) What is the first term?

b) What is the common difference ?

c)What is the difference between the 10^{th} and 20^{th} terms of this sequence?

d) Can the difference between any two terms of this sequence be 363?

Give reason.

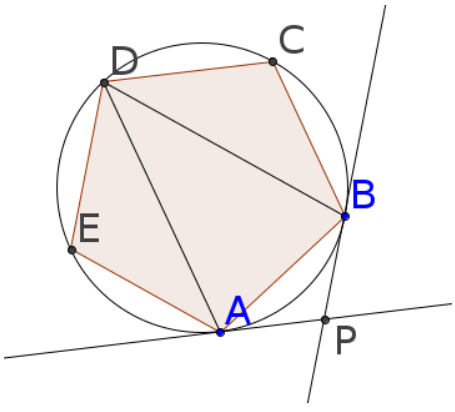
22) ABCDE is a regular pentagon. The tangents at A and B intersectat P.

a) Find the measure of < E .

b) Find the measure of < ADE .

c)Find the measurs of < PAB and < PBA

d) Find the measure of < APB



23) The monthly consumption of electricity of 75 households in a locality are given below.

Monthly consumption	Number of houses
65-85	4
85-105	5
105-125	13
125-145	20
145-165	14
165-185	8
185-205	4
205-225	7
	75

a)In which class is the maximum consumption?

b)Which is the median class?

c)Find the median.

24) a) Write the sequence of odd numbersgreater than 1.

b)What is the algebraic form of the above sequence ?

c)What is the algebraic form of the arithmetic sequence $\frac{3}{6}, \frac{5}{6}, \frac{7}{6}$.....?

d)Prove that no natural number is a term of this sequene.

25) Two cones are made of sectors with central angles 216° and288° and radius 10cm.each.

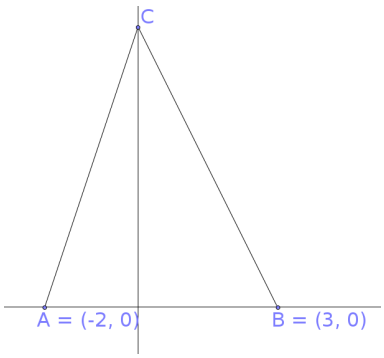
a) Find the radii of the two cones.

b) Find their heights.

c) Find the ratio between their volumes.

26) In triangle ABC , AB= 6 c.m., $< A = 60^0$, $< B = 50^0$.Draw triangle ABC and draw its incircle. Measure the radius of the incircle.

27)In Δ ABC A(-2,0) ,B(3,0) and area of the triangle is 15 cm^2.



a) What is the length of AB ?

b) What is the height of the triangle?

c) Write the coordinates of C .

d)Draw the coordinate axes and mark the points A,B,C and join them to form Δ ABC .

28) In10 A there are 20 boys and 24 girls. In 10B there are 22 boys and18 girls. If one student is selected from each class

a)What is the possible number of pairs ?

b)What is the probability that both are girls?

c)What is the probability that both are boys?

d)What is the probability that atleast one is a girl?

29) In a right triangle one perpendicular side is 7c.m longer than the other. Hypotenuse is 9.c.m. more than the shortest side.

a)If the length of the shortest side is x ,express the lengths of the other two sides in terms of x.

b)What is the relation between the three sides of a right triangle ?

c)Find the lengths of the three sides of this right triangle.