Self Evaluation

Mathematics Test 3

1 hour

25 scores

1) In the polynomial $p(x) = ax^3 + bx^2 + cx + d$, $a + b = -7, c + d = 7$ then which of the following is always a factor of $p(x)$?

(a) $x - 1$ (b) $x + 1$ (c) $x + 2$ (d) $x - 2$

1 score

2) In triangle ABC if $A(0, 0), B(6, 0), C(0, 8)$ then

a) What is the mid point of the side BC?

b) What is the radius of the circle passing through the vertices?

2 score

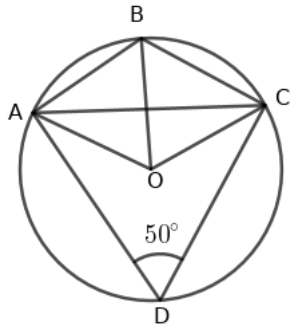
3) The radius and height of a cone are equal. Slant height is 12 cm

a) What is the radius ?

b) Find the curved surface area of the cone

2 score

4) In the figure O is the centre of the circle. $AB = BC$, $\angle ADC = 50^\circ$



a) What is the measure of $\angle AOC$?

b) What is the measure of $\angle ABC$

c) What is the measure of $\angle BAC, \angle BCA$

3 score

5) $97, 94, 91 \cdots$ എന്ന സമാന്തരശ്രേണി പരിഗണിക്കുക

a) What is the common difference ?

b) Write the algebraic form of this sequence?

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

3 score

6) Sum of the area of two squares is 116sq.cm .The difference between the perimetres is 24.

a) If the side of the small square is x then what is the side of the big square?

b) Form a second degree equation.

c) Calculate the side of the squares .

4 score

7) One side of a triangle is 6cm.Angle at the ends of this side are $40°, 60°$.

a) Draw the triangle.

b) Construct the circle which touches its sides.

5 score

8) A child standing in the bank of a river observes the top of a tree on the other side of the river at an angle of elevation $60°$. When moves 20metre back the top of the tree is found at the angle $30°$.

a) Draw a rough diagram

b) Calculate the height of the tree.

c) Calculate the width of the river.

5 score

SJ Self Evaluation Series

Answers

1) $\star\ a+b+c+d=-7+7=0$.That is $p(1)=0$

$\star\ x-1$ is always a factor

2) Triangle $ABC$is a right triangle .$\angle A=90°$

a) Mid point of BC is $(\frac{0+6}{2},\frac{8+0}{2})=(3,4)$

b) $BC=\sqrt{6^2+8^2}=10$.
Radius of the circumcircle 5

3) h, r, lform a
$45°-45°-90°$triangle

a) $r=\frac{12}{\sqrt{2}}=6\sqrt{2}$cm

b) $\pi rl=72\sqrt{2}\pi$sq.cm

4) a) $\angle AOC=100°$

b) $\angle ABC=180-50=130°$

c) $\angle BAC=\angle BCA=\frac{180-130}{2}=25°$

5) a) $d=94-97=-3$

b) $x_n=dn+(f-d)=-3n+(97-^-3)=-3n+100$

c) $-3n+100<0\rightarrow -3n<-100$
$3n>100, n>\frac{100}{3}$
$n>33.33, n=34$

$x_{34} = -3 \times 34 + 100 = -2$

First negative term is -2

6) a) If the larger side is y,$4y - 4x = 24, y - x = 6, y = x + 6$

b) $x^2 + (x+6)^2 = 116, x^2 + x^2 + 12x + 6^2 = 116$
$2x^2 + 12x + 36 = 116$, $x^2 + 6x = 40$

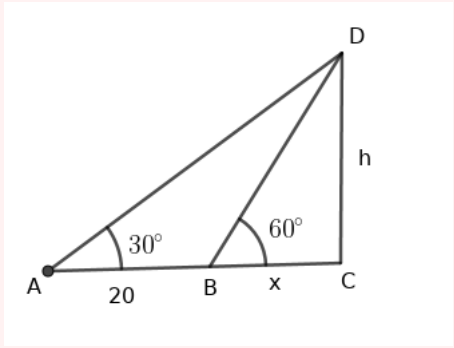
c) $x^2 + 6x + 9 = 49, (x+3)^2 = 49, x + 3 = 7, -7$
$x = 7 - 3 = 4$. sides are $x = 4$cm , $y = 6 + 4 = 10$ cm

7) ⋆ Draw a triangle using the given measurements

⋆ Draw the bisectors of two angles. They intersect at a point.

⋆ Draw perpendicular from this point to the side . Take the intersecting point of the angle bisectors as the centre and perpendicular distance to the side as diametre , draw the circle.

8) a) Draw figure



b) Triangle $BCD$is a $30° - 60° - 90°$triangle .
$BC = x$, $h = \sqrt{3}x$
Triagle ACD is a $30° - 60° - 90°$triangle .
$20 + x = \sqrt{3}h = \sqrt{3} \times \sqrt{3}x$
$20 + x = 3x, 20 = 2x, x = 10$metre

c) Height of the tree $= \sqrt{3}x = 10\sqrt{3}$metre

d) Width of the river 10metre

[1]Prepared by John P A , 9847307721 , sjpuzzles@gmail.com,jpavpz@gmail.com