Self Evaluation

Mathematics Test 2

1 hour

25 scores

1) Algebraic form of an arithmetic sequence is $\frac{3}{7}n+1$. What is the first integer term of this sequence?

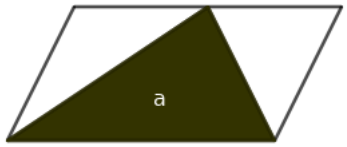
(a) 4 (b) 7 (c) 12 (d) 6

1 score

2) Black triangle is drawn inside a parallelogram such that the one side of the triangle coincides on side of the parallelogram and opposite vertex is on the opposite side.If the area triangle is a then

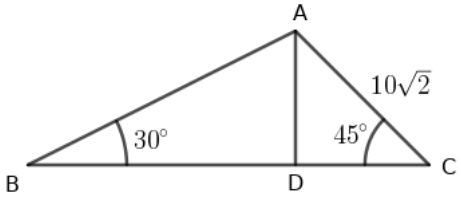
a) What is the area of the parallelogram?

b) A fine dot is placed into the figure without looking into the figure. What is the probability of falling the dot in the black triangle?



2 score

3) In triangle ABC , AD is perpendicular to BC, $\angle B = 30^\circ$ and $\angle C = 45^\circ$, $AC = 10\sqrt{2}$cm



a) What is the length of the altitude to BC?

b) What is the length of the side AB?

2 score

4) A semicircular plate of radius 10cm is rolled into a cone.

a) What is the slant height of the cone?

b) What is the radius of the cone?

c) Calculate the curved surface area of the cone?

3 score

5) $(-1,1),(2,-2),(-3,3)$ are three points on a line.

a) Write the coordinates of another point on this line?

b) What is the slope of this line?

c) Write the general relation between the coordinates of points on line that you observe from the given points .

3 score

6) $p(x) = x^3 - 4x^2 + 7x - 4$ is a third degree polynomial.

a) Find $p(1)$

b) Write a first degree factor of this polynomial.

c) Which number should be added to $p(x)$ to get a polynomial $q(x)$ in which $x + 1$ is a factor?

4 score

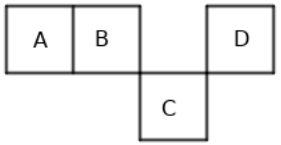
7) Two angles of a triangle are $70°$ and $80°$.The vertices of the triangle are on a circle of radius 3 cm.

a) Construct the triangle.

b) Write the principle of construction.

5 score

8) The squares are taken from a calandar . Each square contains a day number.



a) If $A = x$ write B, C and D

b) If $C \times D = 91$ then form a second degree equation in x

c) Find x by solving the equation.

d) Write B, C and D

5 score

SJ Self Evaluation Series

Answers

1) ⋆ If $n = 7$then $x_7 = \frac{3}{7} \times 7 + 1 = 4$

⋆ Correct option is a

2) One side of the triangle and altitude to the side is equal to side and altitude of the parallelogram

a) $2a$

b) $\frac{1}{2}$

3) $\triangle ADC$is a $45° - 45° - 90°$right triangle .
$AD = CD = 10$cm
Triangle $ADB$is a $30° - 60° - 90°$right triangle .Side

opposite to 30° is 10cm .
$BD = 10\sqrt{3}$cm

a) $BC = 10\sqrt{3} + 10$

b) $AB = 20$cm

4) a) $l = 10$cm

b) $lx = 360r \rightarrow 10 \times 180 = 360 \times r$
$r = \frac{10 \times 180}{360} = 5$cm

c) $\pi rl = 50\pi$sq.cm

5) a) $(4, -4)$ or any pair with the sum of $x$coordinates and y coordinates is 0

b) slope $= \frac{y_2 - y_1}{x_2 - x_1} = -1$

c) $x = -y$ or $y = -x$ or $x + y = 0$

6) a) $p(1) = 1^3 - 4 \times 1^2 + 7 \times 1 - 4 = 1 - 4 + 7 - 4 = 0$

b) $x - 1$

c) Number to be added is k
$q(x) = x^3 - 4x^2 + 7x - 4 + k$
$q(-1) = 0 \rightarrow (-1)^3 - 4(-1)^2 + 7(-1) - 4 +$
$k = 0$
$k = 16$

7) $\star$ Draw a circle of radius 3cm

$\star$ Two angles are 70° and 80°. Take twice of these angles $140^\circ - 160^\circ$. Divide the angle around the centre as $140^\circ - 160^\circ$

$\star$ Three radii should be drawn . Draw a triangle by joining the ends of the radii

b) Angle formed by the arc at the centre is twice the angle in the complement.

8) a) $B = x + 1, C = x + 9, D = x + 3$

b) $(x + 9)(x + 3) = 91 \rightarrow x^2 + 12x + 27 = 91, x^2 + 12x = 91 - 27 = 64$
$x^2 + 12x + 36 = 64 + 36 = 100$
$(x + 6)^2 = 100, x + 6 = 10, x = 4$

c) $B = 5, C = 13, D = 7$

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