UNIT 1 QUANTITATIVE ABILITY III

T6: Functions and Graphs

Find the area of the triangle formed by the vertices (4, 5), (10, 12) and (-3, 2)

Solution:

The area of the triangle having its vertices as P(x1, y1), Q(x2, y2) and R(x3, y3) is given by

1/2 [x1(y2−y3)+x2(y3−y1)+x3(y1−y2)]

= 1/2[4(12−2)+10(2−5)+(−3)(5−12)]

= 1/2[(4×10)+(10×−3)+(−3)(−7)]

= 1/2[40−30+21] = 15.5

Find the distance of the point A (5, -5) from the origin.

The Distance from Origin (0,0) can be calculated using Distance formula.

$\rightarrow \sqrt{(0-(-5))2 + 0 - (-5))2}$

$= \sqrt{5^2 + 5^2} = \sqrt{50}$

$= 5\sqrt{2}$ units

If the points A(2, 3), B(5, K) and C(6, 7) are collinear, then k = ?

Solution:
Given 3 points A(2,3), B(5,k) and C(6,7) which are collinear we have to find the value of k.
Points are collinear if the slopes of any two pairs are equal.
Slope of AB = $\frac{y_2-y_1}{x_2-x_1}$ = $\frac{k-3}{5-2}$
Slope of BC = $\frac{y_2-y_1}{x_2-x_1}$ = $\frac{7-k}{6-5}$
As lines are collinear slopes are equal $\Rightarrow \frac{k-3}{5-2} = \frac{7-k}{6-5}$
$\Rightarrow k-3 = 2(7-k) \Rightarrow 4k = 21+3$
$\Rightarrow k = 6$ The value of k is 6.

Which of the following is not an odd function?

$f(x) = -x^3$

$f(x) = x^5$

$f(x) = x^2 - x$

$f(x) = |x|^3$

Concept: Odd and Even Functions

Solution:

An odd function is a function whose value reverses in sign for a reversal in sign of its argument. i.e. $f(x) = -f(-x)$.

Except $f(x) = |x|^3$ all other functions mentioned in the choices change values.

Find the nth term for the AP: 11, 17, 23, 29, …
Solution:
Here, a = 11, d = 17 – 11 = 23 – 17 = 29 – 23 = 6We know that nth term of an AP is a + (n – 1) d=> nth term for the given AP = 11 + (n – 1) 6=> nth term for the given AP = 5 + 6 nWe can verify the answer by putting values of 'n'.=> n = 1 -> First term = 5 + 6 = 11=> n = 2 -> Second term = 5 + 12 = 17=> n = 3 -> Third term = 5 + 18 = 23and so on …

Q2: Find the sum of the AP in the above question till the first 10 terms.
Solution :
From the above question, => nth term for the given AP = 5 + 6 n=> First term = 5 + 6 = 11=> Tenth term = 5 + 60 = 65=> Sum of 10 terms of the AP = 0.5 n (first term + last term) = 0.5 x 10 (11 + 65)=> Sum of 10 terms of the AP = 5 x 76 = 380