# Agriculture Department Assam

## Mathematics

**1.In an Arithmetic Progression, if a=28, d=-4, n=7, then $a_n$ is:**

(a)4

(b)5

(c)3

(d)7

Answer: **a**

Explanation: For an AP,

$a_n$ = a+(n-1)d

= 28+(7-1)(-4)

= 28+6(-4)

= 28-24

$a_n$=4

**2.If a=10 and d=10, then first four terms will be:**

(a)10,30,50,60

(b)10,20,30,40

(c)10,15,20,25

(d)10,18,20,30

Answer: **b**

Explanation: a = 10, d = 10

$a_1$ = a = 10

$a_2$ = $a_1$+d = 10+10 = 20

$a_3$ = $a_2$+d = 20+10 = 30

$a_4$ = $a_3$+d = 30+10 = 40

**3.The first term and common difference for the A.P. 3,1,-1,-3 is:**

(a)1 and 3

(b)-1 and 3

(c)3 and -2

(d)2 and 3

Answer: **c**

Explanation: First term, a = 3

Common difference, d = Second term − First term

⇒ 1 − 3 = -2

⇒ d = -2

**4.30th term of the A.P: 10,7, 4, …, is**

(a)97

(b)77

(c)-77

(d)-87

Answer: **c**

Explanation: Given,

A.P. = 10, 7, 4, …

First term, a = 10

Common difference, d = $a_2 − a_1$ = 7−10 = −3

As we know, for an A.P.,

$a_n$ = a +(n−1)d

Putting the values;

$a_{30}$ = 10+(30−1)(−3)

$a_{30}$ = 10+(29)(−3)

$a_{30}$ = 10−87 = −77

**5.11th term of the A.P. -3, -1/2, ,2 …. Is**

(a)28

(b)22

(c)-38

(d)-48

Answer: **b**

Explanation: A.P. = -3, -1/2, ,2 …

First term a = − 3

Common difference, d = $a_2 − a_1$ = (-1/2) -(-3)

⇒(-1/2) + 3 = 5/2

Nth term;

$a_n$ = a+(n−1)d

Putting the values;

$a_{11}$ = 3+(11-1)(5/2)

$a_{11}$ = 3+(10)(5/2)

$a_{11}$ = -3+25

$a_{11}$ = 22

**6.The missing terms in AP: __, 13, __, 3 are:**

(a)11 and 9

(b)17 and 9

(c)18 and 8

(d)18 and 9

Answer: **(c)**

Explanation: $a_2$ = 13 and

$a_4$ = 3

The nth term of an AP;

$a_n$ = a+(n−1) d

$a_2 = a + (2-1)d$

$13 = a + d$ ……………… (i)

$a_4 = a + (4-1)d$

$3 = a + 3d$ …………. (ii)

Subtracting equation (i) from (ii), we get,

$-10 = 2d$

$d = -5$

Now put value of d in equation 1

$13 = a + (-5)$

$a = 18$ (first term)

$a_3 = 18 + (3-1)(-5)$

$= 18 + 2(-5) = 18 - 10 = 8$ (third term).

**7. Which term of the A.P. 3, 8, 13, 18, … is 78?**

(a)12th

(b)13th

(c)15th

(d)16th

Answer: **(d)**

Explanation: Given, 3, 8, 13, 18, … is the AP.

First term, a = 3

Common difference, $d = a_2 - a_1 = 8 - 3 = 5$

Let the nth term of given A.P. be 78. Now as we know,

$a_n = a + (n-1)d$

Therefore,

$78 = 3 + (n-1)5$

$75 = (n-1)5$

(n−1) = 15

n = 16

**8.The 21st term of AP whose first two terms are -3 and 4 is:**

(a)17

(b)137

(c)143

(d)-143

Answer: **b**

Explanation: First term = -3 and second term = 4

a = -3

d = 4-a = 4-(-3) = 7

$a_{21} = a+(21-1)d$

=-3+(20)7

=-3+140

=137

**9. If 17th term of an A.P. exceeds its 10th term by 7. The common difference is:**

(a)1

(b)2

(c)3

(d)4

Answer: **(a)**

Explanation: Nth term in AP is:

$a_n = a+(n-1)d$

$a_{17} = a+(17−1)d$

$a_{17} = a +16d$

In the same way,

$a_{10} = a+9d$

Given,

$a_{17} - a_{10} = 7$

Therefore,

$(a+16d)-(a+9d) = 7$

$7d = 7$

$d = 1$

Therefore, the common difference is 1.

**10. The number of multiples of 4 between 10 and 250 is:**

(a)50

(b)40

(c)60

(d)30

Answer: **(c)**

Explanation: The multiples of 4 after 10 are:

12, 16, 20, 24, …

So here, a = 12 and d = 4

Now, 250/4 gives remainder 2. Hence, 250 − 2 = 248 is divisible by 2.

12, 16, 20, 24, …, 248

So, nth term, $a_n$ = 248

As we know,

$a_n = a+(n-1)d$

$248 = 12+(n-1)×4$

$236/4 = n-1$

$59 = n-1$

$n = 60$

**11. 20th term from the last term of the A.P. 3, 8, 13, …, 253 is:**

(a)147

(b)151

(c)154

(d)158

Answer: **(d)**

Explanation: Given, A.P. is 3, 8, 13, …, 253

Common difference, d= 5.

In reverse order,

253, 248, 243, …, 13, 8, 5

So,

a = 253

d = 248 − 253 = −5

n = 20

By nth term formula,

$a_{20}$ = a+(20−1)d

$a_{20}$ = 253+(19)(−5)

$a_{20}$ = 253−95

$a_{20}$ = 158

**12. The sum of the first five multiples of 3 is:**

(a)45

(b)55

(c)65

(d)75

Answer: **(a)**

Explanation: The first five multiples of 3 is 3, 6, 9, 12 and 15

a=3 and d=3

n=5

Sum, $S_n$ = n/2[2a+(n-1)d]

$S_5$ = 5/2[2(3)+(5-1)3]

=5/2[6+12]

=5/2[18]

=5 x 9

= 45

**13.The midpoints of a line segment joining two points A(2, 4) and B(-2, -4)**

(a) (-2,4)

(b) (2,-4)

(c) (0, 0)

(d) (-2,-4)

Answer: c

Explanation: As per midpoint formula, we know;

x=[2+(-2)]/2 = 0/2 = 0

y=[4+(-4)]/2=0/2=0

Hence, (0,0) is the midpoint of of AB.

**14.The distance of point A(2, 4) from x-axis is**
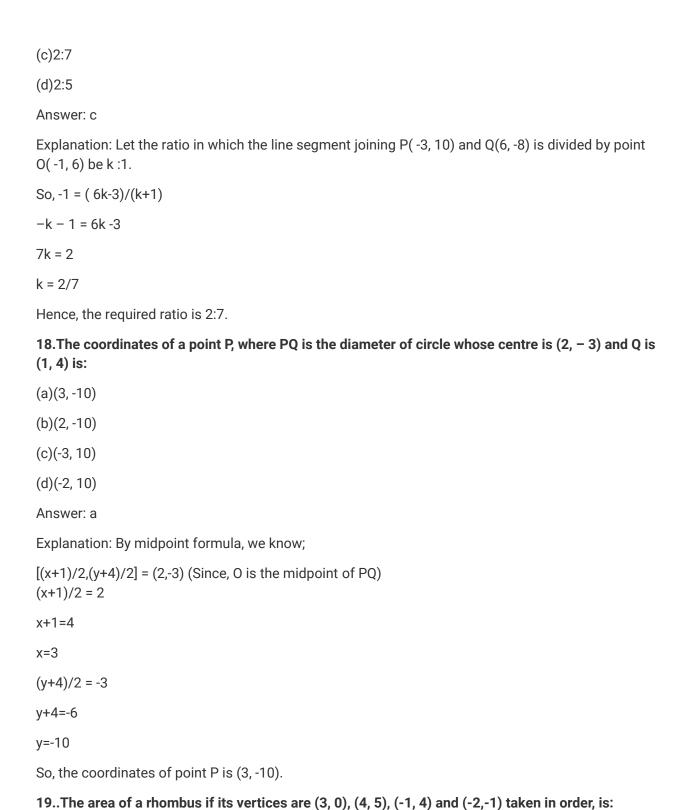
(a)2

(b)4

(c)-2

(d)-4

Answer: b

Explanation: Distance of a point from x-axis is equal to the ordinate of the point.

**15.If O(p/3, 4) is the midpoint of the line segment joining the points P(-6, 5) and Q(-2, 3). The value of p is:**

(a)7/2

(b)-12

(c)4

(d)-4

Answer: b

Explanation: Since, (p/3, 4) is the midpoint of line segment PQ, thus;

p/3 = (-6-2)/2

p/3 = -8/2

p/3 = -4

p= -12

Therefore, the value of p is -12.

**16.The points which divides the line segment of points P(-1, 7) and (4, -3) in the ratio of 2:3 is:**

(a)(-1, 3)

(b)(-1, -3)

(c)(1, -3)

(d)(1, 3)

Answer: d

Explanation: By section formula we know:

x=[(2.4)+(3.(-1))]/(2+3) = (8-3)/5 = 1

y=[(2.(-3))+(3.7)]/(2+3) = (-6+21)/5 = 3

Hence, the required point is (1,3)

**17.The ratio in which the line segment joining the points P(-3, 10) and Q(6, − 8) is divided by O(-1, 6) is:**

(a)1:3

(b)3:4

(c)2:7

(d)2:5

Answer: c

Explanation: Let the ratio in which the line segment joining P( -3, 10) and Q(6, -8) is divided by point O( -1, 6) be k :1.

So, -1 = ( 6k-3)/(k+1)

−k − 1 = 6k -3

7k = 2

k = 2/7

Hence, the required ratio is 2:7.

**18.The coordinates of a point P, where PQ is the diameter of circle whose centre is (2, − 3) and Q is (1, 4) is:**

(a)(3, -10)

(b)(2, -10)

(c)(-3, 10)

(d)(-2, 10)

Answer: a

Explanation: By midpoint formula, we know;

[(x+1)/2,(y+4)/2] = (2,-3) (Since, O is the midpoint of PQ)
(x+1)/2 = 2

x+1=4

x=3

(y+4)/2 = -3

y+4=-6

y=-10

So, the coordinates of point P is (3, -10).

**19..The area of a rhombus if its vertices are (3, 0), (4, 5), (-1, 4) and (-2,-1) taken in order, is:**

(a)12 sq.unit

(b)24 sq.unit

(c)30 sq.unit

(d)32 sq.unit

Answer: 24

Explanation: To find the area of the rhombus, we need to find the length of its diagonals and use the below formula:

Area = ½ (Diagonal$_1$)(Diagonal$_2$)

Area = (1/2 ) (AC)(BD)

Diagonal$_1$=√[(3-(-1))$_2$+(0-4)$_2$]= 4√2

Diagonal$_2$ = √[(4-(-2))$_2$+(5-(-1))$_2$]=6√2

Area = ½ x 4√2 x 6√2 = 24 sq.unit.