APTITUDE - BASIC ARITHMETIC EXAMPLES

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Q 1 - Which of the following is the 16^{th} term of A.P. 5, 8, 11, 14, 17, ...?

A - 50

B - 51

C - 52

D - 53

Answer - A

Explanation

```
Here a = 5, d = 8 - 5 = 3, n = 16
Using formula Tn = a + (n - 1)d
T16 = 5 + (16 - 1) x 3
= 50
```

Q 2 - Which of the following term of A.P. 4, 9, 14, 19, 24, ... is 109?

A - 20^{th}

B - 21^{st}

C - 22^{nd}

D - 23^{rd}

Answer - C

Explanation

```
Here a = 4, d = 9 - 4 = 5
Using formula Tn = a + (n - 1)d
Tn = 4 + (n - 1) x 5 = 109 where 109 is the nth term.
=> 4 + 5n - 5 = 109
=> 5n = 109 + 1
=> n = 110 / 5
= 22
```

Q 3 - How many terms are present in the A.P. 7, 13, 19, ... 205?

A - 31

B - 32

C - 33

D - 34

Answer - D

Explanation

```
Here a = 7, d = 13 - 7 = 6, Tn = 205
Using formula Tn = a + (n - 1)d
Tn = 7 + (n - 1) x 6 = 205 where 205 is the nth term.
=> 7 + 6n - 6 = 205
=> 6n = 205 - 1
=> n = 204 / 6
= 34
```

Q 4 - Which of the following is the first term of A.P. if 6^{th} term is 12 and 8^{th} term is 22?

A - -13

B - 13

C - 2

D - 1

Answer - A

Explanation

```
Using formula Tn = a + (n - 1)d
T6 = a + (6 - 1)d = 12   ...(i)
T8 = a + (8 - 1)d = 22   ...(ii)
Substract (i) from (ii)
=> 2d = 10
=> d = 5
Using (i)
a = 12 - 5d
= 12 - 25
= -13
```

Q 5 - Which of the following is the common difference of A.P. if 6^{th} term is 12 and 8^{th} term is 22?

A - 4

B - 5

C - 6

D - 7

Answer - B

Explanation

```
Using formula Tn = a + (n - 1)d
T6 = a + (6 - 1)d = 12   ...(i)
T8 = a + (8 - 1)d = 22   ...(ii)
Substract (i) from (ii)
=> 2d = 10
=> d = 5
```

Q 6 - Which of the following is the 16^{th} term of A.P. if 6^{th} term is 12 and 8^{th} term is 22?

A - 60

B - 61

C - 62

D - 63

Answer - C

Explanation

```
Using formula Tn = a + (n - 1)d
T6 = a + (6 - 1)d = 12   ...(i)
T8 = a + (8 - 1)d = 22   ...(ii)
Substract (i) from (ii)
=> 2d = 10
=> d = 5
Using (i)
a = 12 - 5d
= 12 - 25
= -13
∴ T16 = -13 + (16 - 1) x 5
= 75 - 13
= 62
```

Q 7 - Which of the following is the sum of first 17 term of A.P. 5, 9, 13, 17, ...?

A - 626

B - 627

C - 628

D - 629

Answer - D

Explanation

```
Here a = 5, d = 9 - 5 = 4, n = 17
Using formula Sn = (n/2)[2a + (n - 1)d]
S17 = (17/2)[2 x 5 + (17 - 1) x 4]
= (17/2)(10 + 64)
= 17 x 74 / 2
= 629
```

Q 8 - Which of the following is the sum of the series 2, 5, 8, ..., 182?

A - 5612

B - 5613

C - 5614

D - 5615

Answer - A

Explanation

```
Here a = 2, d = 5 - 2 = 3, T^n = 182
Using formula Tn = a + (n - 1)d
```

```
a + (n - 1)d = 182
=> 2 + (n - 1) x 3 = 182
=> 3n = 183
=> n = 61.
Using formula Sn = (n/2)[2a + (n - 1)d]
S61 = (61/2)[2 x 2 + (61 - 1) x 3]
= (61/2)(4 + 180)
= 61 x 184 / 2
= 5612
```

Q 9 - What are the three numbers in A.P. if their sum is 15 and product is 80?

A - 5, 7, 3

B - 2, 5, 8

C - 6, 7, 2

D - 5, 5, 5

Answer - B

Explanation

```
Let've numbers are a - d, a and a + d
Then a - d + a + a + d = 15
=> 3a = 15
=> a = 5
Now (a - d)a(a + d) = 80
=> (5 - d) x 5 x (5 + d) = 80
=> 25 - d^2 = 16
=> d^2 = 9
=> d = +3 or -3
∴ numbers are either 2, 5, 8 or 8, 5, 2.
```

Q 10 - Which of the following is the 9^{th} term of G.P. 3, 6 , 12, 18...?

A - 766

B - 768

C - 772

D - 774

Answer - B

Explanation

```
Here a = 3, r = 6 / 3 = 2, T9 = ?
Using formula Tn = ar^(n - 1)
T9 = 3 x 2^(9 - 1)
=3 x 2^8
=3 x 256
=768
```

Q 11 - Which of the following is the first term of G.P. if 4^{th} term is 54 and 9^{th} term is 13122?

A - 2

B - 3

C - 4

D - 6

Answer - A

Explanation

Using formula $T_n = ar^{(n - 1)}$
$T_4 = ar^{(4 - 1)} = 54$
$\Rightarrow ar^3 = 54$ ...(i)
$T_9 = ar^{(9 - 1)} = 13122$
$\Rightarrow ar^8 = 13122$ ...(ii)
Dividing (ii) by (i)
$\Rightarrow r^5 = 13122 / 54 = 243 = (3)^5$
$\Rightarrow r = 3$
Using (i)
a x 27 = 54
$\Rightarrow a = 2$

Q 12 - Which of the following is the common ratio of G.P. if 4^{th} term is 54 and 9^{th} term is 13122?

A - 2

B - 3

C - 4

D - 6

Answer - B

Explanation

Using formula $T_n = ar^{(n - 1)}$
$T_4 = ar^{(4 - 1)} = 54$
$\Rightarrow ar^3 = 54$ ...(i)
$T_9 = ar^{(9 - 1)} = 13122$
$\Rightarrow ar^8 = 13122$ ...(ii)
Dividing (ii) by (i)
$\Rightarrow r^5 = 13122 / 54 = 243 = (3)^5$
$\Rightarrow r = 3$

Q 13 - Which of the following is the 6^{th} term of G.P. if 4^{th} term is 54 and 9^{th} term is 13122?

A - 484

B - 485

C - 486

D - 487

Answer - C

Explanation

Using formula $T_n = ar^{(n - 1)}$
$T_4 = ar^{(4 - 1)} = 54$
$\Rightarrow ar^3 = 54$ ...(i)
$T_9 = ar^{(9 - 1)} = 13122$
$\Rightarrow ar^8 = 13122$ ...(ii)
Dividing (ii) by (i)
$\Rightarrow r^5 = 13122 / 54 = 243 = (3)^5$
$\Rightarrow r = 3$
Using (i)
a x 27 = 54
$\Rightarrow a = 2$
$\therefore T_6 = ar^{(6 - 1)} = 2 \times (3)^5$
$= 2 \times 243$
$= 486$

Q 14 - Sum of two numbers is 80. If three times of first number is same as five times of the second number, what are the numbers?

A - 50, 30

B - 60, 20

C - 70, 10

D - 65, 15

Answer - A

Explanation

Let the numbers are y and 80 - y.
Then 3y = 5(80-y)
$\Rightarrow 8y = 400$
$\therefore y = 50$
and second number = 80 - 50 = 30.

Q 15 - What is the number if its third is greater than its fifth by 16?

A - 150

B - 120

C - 180

D - 210

Answer - B

Explanation

Let the number be y.
Then (y / 3) - (y / 5) = 16
$\Rightarrow 5y - 3y = 16 \times 15 = 240$
$\Rightarrow 2y = 240$
$\therefore y = 120$

Q 16 - What is the largest number among the three consecutive multiples of 3 if there sum is 90?

A - 21

B - 30

C - 33

D - 36

Answer - C

Explanation

```
Let the numbers be 3y , 3y + 3, 3y + 6
Now 3y + 3y + 3 + 3y + 6 = 90
=> 9y = 81
=> y = 9
=> largest number = 3y + 6 = 3 x 9 + 6
= 33
```

Q 17 - Find is the positive integer if fifteen times of it is less than its square by 16.

A - 13

B - 14

C - 15

D - 16

Answer - D

Explanation

Let the positive integer by y.
Then $y^2 - 15y = 16$
$\Rightarrow y^2 - 15y - 16 = 0$
$\Rightarrow y^2 - 16y + y - 16 = 0$
$\Rightarrow y(y-16) + (y-16) = 0$
$\Rightarrow (y+1)(y-16) = 0$
$\therefore y = 16$. as -1 is not a positive integer.

Q 18 - Find is the positive integer if twenty-three times of it is more than its square by 63.

A - 7

B - 8

C - 9

D - 10

Answer - A

Explanation

Let the positive integer by y.
Then $23y - 2y^2 = 63$
$\Rightarrow 23y - 2y^2 - 63 = 0$
$\Rightarrow 2y^2 - 23y + 63 = 0$
$\Rightarrow 2y^2 - 14y - 9y + 63 = 0$
$\Rightarrow 2y(y-7) - 9(y-7) = 0$
$\Rightarrow (2y-9)(y-7) = 0$
$\therefore y = 7$. as $9/2$ is not an integer.

Q 19 - Find the smallest of three numbers if numbers are in ratio of 3:2:5 and sum of their squares is 1862.

A - 13

B - 14

C - 12

D - 11

Answer - B

Explanation

Let've number as 3y, 2y and 5y.
Then $9y^2 + 4y^2 + 25y^2 = 1862$.
=> $38y^2 = 1862$
=> $y^2 = 1862 / 38 = 49$
=> y = 7
∴ smallest number = 2y = 2 x 7 = 14.

Q 20 - Sum of digits of a two digit number is 10. If digits are interchanged, obtained number is 54 less than original number. What is the number?

A - 46

B - 64

C - 82

D - 28

Answer - C

Explanation

Let the ten's digit is x and unit digit of number is y.
Then x + y = 10   ...(i)
(10x + y) - (10y - x) = 54
=> 9x - 9y = 54
=> x - y = 6   ...(ii)
Adding (i) and (ii)
2x = 16
=> x = 8
Using (i)
y = 10 - x = 2
∴ number is 82.