**Question 1: The reflection of a positive integer is obtained by reversing the digits. For example, 321 is the reflection of 123. The difference between a five-digit integer and its reflection must be divisible by which of the following?**

**A. 2 B. 4 C. 5 D. 6 E. 9**

## Solution:

Let the five digit number N be abcde

=> N= 10000a + 1000b + 100c + 10d + e

Now the reflection N1 will be 10000e + 1000d + 100c + 10b + a

N-N1 = 10000(a-e) + 1000(b-d) + 10(d-b) + e-a

=> N-N1 = (a-e)*(10000-1) + (b-d)(1000-10)

=> N-N1 = (a-e)*(9999) + (b-d)*(990)

=> N-N1 = (a-e)*(9*1111) + (b-d)*(9*110)

=> N-N1 = 9[1111(a-e) + 110*(b-d)]

**Hence it is divisible by 9**

**Question 2: What is the remainder of the expression (7^0 + 7^1 + 7^2 + ………… + 7^20) when divided by 14?**

## Solution:

Remainder when 7^0 is divided by 14 is 1

Remainder when 7^1 is divided by 14 is 7

Remainder when 7^2 is divided by 14 is 7

Remainder when 7^3 is divided by 14 is 7

So the pattern continues upto 7^20

So, the total remainder will be 1 + 7(20 times)

=> 1 + 140 = 141

If we divide 141 with 14 the remainder will be 1

Hence the remainder of the given expression when it is divided by 14 is 1

**Question 3: If (3)^(2x) =(3)^(2) * (3)^(x), what is the value of x?**

## Solution:

=> (3)^(2x) =(3)^(2 + x)

=> 2x = 2 + x

=> x = 2

**Question 4: 9. Given three sets R1 = {-1, -2, -3}, R2 = {1, 2, 3} and R3 = {-3, -2, -1, 1, 2, 3}. And Standard Deviation of R1 is S1, Standard Deviation of R2 is S2 and Standard Deviation of R3 is S3.**

**I. S1 > S2**

**II. S2 < 0**

**III. S3 = 0**

**A. Only I**

**B. Only II**

**C. Only III**

## Solution:

S1 = Standard deviation of R1

First find out the mean for all the three sets.

Mean of R1 = -6/3 = -2
Mean of R2 = 6/3 = 2
Mean of R1 = 0/3 = 0
S1 = Sqrt $\{[(-1 - (-2))^2 + (-2 - (-2))^2 + (-3 - (-2))^2]/3\}$ = Sqrt $\{[1^2 + 0^2 + (-1)^2]/3\}$ = sqrt (2/3)
S2 = Sqrt {[(1 - 2)^2 + (2 - 2)^2 + (3 - 2)^2]/3} = Sqrt {[(-1)^2 + 0^2 + 1^2]/3} = sqrt (2/3)
S3 = Sqrt $\{[(-3)_2 + (-2)_2 + (-1)_2 + 1_2 + 2_2 + 3_2]/6\}$ = sqrt(28/6)
I S1 > S2 is wrong since S1 = S2
II S2 < 0 is wrong since S2 = sqrt(2/3)
III S3 = 0 is also wrong
**Hence none of the above is the correct answer**

**<u>Question 5</u>: The value of [Sqrt(15.987) * 601.146]/[15.78 * 301.124] is ………………… ?**
**<u>Solution:</u>**

For these kind of problems we need to round off each number
[Sqrt(15.987) * 601.146]/[15.78 * 301.124]
=> [Sqrt(16) * 602]/[16 * 301]
=> 4 * 602/(16*301)
=> 8/16 = 0.5
Hence the value will be closer to 0.5
Try calculating this value with the help of calculator you will get exact value as 0.5058 which is almost close to 0.5

**<u>Question 6</u>: For a given series P1, P2, P3……....Pn; P1= 1. And for n>=2, if P(n+1) = 5Pn + 4, find Pi such that 'i' is the smallest number divisible by 7?**
**Note: 1, 2, 3, i, n and n+1 are suffixes.**
**<u>Solution:</u>**

Given P1 = 1 and
P(n+1) = 5Pn + 4
The smallest number divisible by 7 is 7 itself.
P2 = 5P1 + 4
P3 = 5(5P1 + 4) + 4 = 25P1 + 4(5+1) = $5^2$ P1 + 4($5^1$ + $5^0$)
P4 = 5(25P1 + 4(5+1)) = $5^3$ P1 + 4($5^2$ + $5^1$) = $5^{4-1}$ P1 + 4($5^{4-2}$ + $5^{4-3}$)
So, in general
Pn = $5^{n-1}$ P1 + 4($5^{n-2}$ + $5^{n-3}$)
So, P7 = $5^{7-1}$ P1 + 4($5^{7-2}$ + $5^{7-3}$) = $5^6$ P1 + 4($5^5$ + $5^4$) = 15625 + 4(3125 + 625) = 15625 +4(3750)=> 15625 + 15000 = 30625

**<u>Question 7</u>: Given that set A consists of positive odd numbers less than 100, set B consists of positive even numbers less than 5 and if set C consists of product of set A and set B. Find the number of numbers possible in set C?**
**<u>Solution:</u>**

That is A = { 2n + 1} where n = 0, 1, 2.....49 [total 50 terms]
Set B = {2, 4}
Now the product of A and B will be
A1 = {2*(2n + 1)} = {4n + 2} where n = 0, 1, 2.....49 [total 50 terms]
A2 = {4*(2m + 1)} = {8m + 4} where m = 0, 1, 2,....49. [total 50 terms]

Now we need to find out that in the two sets will there be any common terms.
If there is any common term then we will get total number of elements will be less than 100
If there are no common term then we will get the total number of elements as 100.
Let us see whether there exists any common terms.
For common term to exist it must satisfy both the forms
=> $4n + 2 = 8m + 4$
=> $4n = 8m + 2$
=> $2n = 4m + 1$
We need to find out all m and n's which satisfy the above condition with all m,n 0, 1, 2...49
But observe that RHS will always an odd number, agree?
Because 4m will always an even number and even number + 1 will always be an odd number.
But LHS will always be an even number that is 2*any number will be always an even number
Since even number cannot be equal to odd number, we cannot find any values for m and n which satisfies the expression $2n = 4m + 1$
Hence there are no common terms in them.
**So, the total number of elements in the required set will be 100**

**<u>Question 8</u>: When 'k' is divided by 12 it gives remainder 5, what will be remainder when k^2 is divided by 8?**
<u>Solution:</u>

Given that when k is divided by 12 it leaves a remainder of 5.
So, k will be of the form
k = 12m + 5
Now k^2 = 144m^2 + 25 + 120m = 8(18m + 15) + 25
So, if k^2 is divided by 8 it will leave a remainder which is equal to the remainder when 25 is divided by 8 (Since first term is a multiple of 8 and so it leaves a remainder of 0)
=> Remainder when 25 is divided by 8 is 1
**Hence the remainder is 1.**

**<u>Question 9</u>: The value of (14^10 + 7^2)^2 - (14^10 - 7^2)^2 is ……..?**
<u>Solution:</u>

Use the formula a^2 – b^2 = (a +b)(a-b)
Here a = 14^10 + 7^2 and
b = 14^10 – 7^2
Now, $(14^{10}+7^2)^2 – (14^{10}-7^2)^2 = (14^{10}+7^2 + 14^{10}-7^2)*(14^{10}+7^2-14^{10} + 7^2)$
=> $2*14^{10}*2*7^2$
=> $2*(2*7)^{10}*2*7^2$
=> $2*2^{10}*7^{10}*2*7^2$
=> $2^{12}*7^{12}$
=> $(2*7)^{12}$
**=> $14^{12}$ Is the correct answe**

**<u>Question 10</u>: Given a1 = -9, a2 = -4, such that an = a(n-1) - a(n-2). Calculate sum of first 100 terms?**
**Note: (Here 1, 2, (n – 1) and (n – 2) are suffixes)**
<u>Solution:</u>

Sum of first 100 terms will be
$a1 + a2 + a3 + a4 + ... + a99 + a100$
$\Rightarrow a1 + a2 + (a2-a1) + (a3 - a2) + (a4 - a3) + .... + (a98 - a97) + (a99 - a98)$
$\Rightarrow a2 + a99$
We need to find out a99
$a3 = a2 - a1$
$a4 = a3 - a2 = a2 - a1 - a2 = -a1$
$a5 = a4 - a3 = -a1 - a2 + a1 = -a2$
$a6 = a5 - a4 = -a2 - (-a1) = -a2 + a1$
$a7 = a6 - a5 = -a2 + a1 - (-a2) = a1$
$a8 = a7 - a6 = a1 - (-a2 + a1) = a2$
Hence the pattern repeats like this a1 , a2 , a2 – a1, -a1, -a2, -a2 + a1.....
That is from 7th term onwards the same pattern repeats......
So, a7 will be the same as a1
a8 will be the same as a2
a9 will be the same as a3
a10 will be the same as a4
a11 will be the same as a5
That is a1, a7, a13, a20, will be the same
$1+ (n-1)6 = 6n - 5$
a99 doesn't comes under this category
a2, a8, a14,...will be the same
$2 + (n-1)6 = 6n-4$
same with here...
a3, a9, a15,...so will be the same category
$3+ (n-1)6 = 6n - 3$
Yes a99 comes under this category
Because substitute n = 17 in 6n – 3 we will get 99
Hence $a99 = a3 = a2 - a1$
Hence the sum of all 100 terms will be $= a2 + a99 = a2 + a2 - a1 = 2a2 - a1 = 2(-4) - (-9)$
$-8 + 9 = 1$
**Hence 1 is the final answer.**

**<u>Question 11</u>: If -6 <= x <= 4 and -10 <= y <= 4, then what is the greatest value of (–x^2 + y^4)?**
**A. 16**
**B. 240**
**C. 10,000**
**D. 10,036**
**& so on……………**
**<u>Solution</u>:**

For y^4 – x^2 to be maximum
=> y^4 to be maximum and x^2 must be minimum.
The minimum value of square of a variable is 0 and that is for the value of 0
Since 0 lies in the given interval for x i.e., -6<= x <= 4
Hence minimum value of x^2 = 0

And Maximum value of y in the given interval -10 < = y <= 4 will be at x = -10 (since the power to which y is raised is an even number and -ve number to the power of an even number will be a positive number)

=> Max(y^4) = 10^4

So, Max(y^4 – x^2 ) = Max(y^4) – Min(x^2)
=> 10000 – 0 = 10000
**Hence C is the correct answerC**

**<u>Question 12</u>: What is the nearest value of sqrt(171)?**
**A. 12**
**B. 13**
**C. 14**
**& so on………**
**Solution:**
First find out the squares of 13 and 14
=> 13^2 = 169
and 14^2 = 196

Now find out whether 171 is closer to 169 or 196 (and the corresponding values square root will be nearest value of sqrt(171))

Difference between 171 and 169 is 2
where as diff. Between 196 and 171 is 25
Since the diff. Between 171 and 169 is smaller there nearest value will be the sqrt(169) =13
Hence 13 is the nearest value of sqrt(171)

**<u>Question 13</u>: For the equation $x^2 – x – 2 <=0$; how many solutions are possible?**
**Solution:**

Consider the expression $x^2 – x – 2$
=> $x^2 – 2x + x – 2$
=>x(x-2)+1(x-2)
=> (x-2)(x+1)
Now given inequality is that
(x-2)(x+1)<=0
Possible solutions are -1<=x<=2
Since x is not an integer it can take infinitely many values in between -1 and 3.
So, the answer is infinity

But if they mention in the that x takes only the integer values then the answer will be all integers which lie between -1 and 3 including -1 and 3
That means -1, 0, 1, 2, 3 total of 5

**<u>Question 14</u>: Given a series 3, 1, 4, 2, 3, 1, 4, 2……………………….. What is the product of the 67th and 68th term?**
**Solution:**

Given series 3 1 4 2 3 1 4 2 3 1 4 2 …….
So, After every four terms the same pattern repeats.

That is,
t1 = t5 = t9 = ..... = 3
t2= t6= t10= t14=....1
t3= t7= t11= t15=....4
t4 = 2, t8 = 2, t12 = 2 .....
So, t67 comes in the pattern of t3 that is 4
and t68 comes in the pattern of t4 that is 2
Hence the product is 4*2 = 8

**Simple method is to find out the remainder of the given term with 4**
(Reason for finding out the remainder with 4 is that here the terms show same pattern for 4 terms. If the terms show same pattern 5 terms then find out the remainder with 5 and the rest will be same as follows)
Now assign for remainder 0 the value is 2 (fourth term)
For remainder 1 the value is 3 (1st term)
For remainder 2 the value is 1 (2nd term)
For remainder 3 the value is 4 (3rd term)
Now the remainder when 67 is divided by 4 is 3 hence the value of t67 = 4 and
Remainder when 68 is divided by 4 is 0 hence the value of t68 = 2
**Hence the answer follows**

**Question 15: Given N= v * w * x * y * z - (v+w+x+y+z). If 'N' is an even integer, then how many of v, w, x, y, z will need to be even numbers?**
Solution:

Let all the numbers be odd
Then A = v * w * x * y * z = Which is a product of all odd numbers
Hence the number A will be an odd number
Now consider B = (v+w+x+y+z) = Which is a sum of all odd numbers for odd times
Hence the number B will be an odd number

**Since:**
**Sum of even total of odd numbers is even number**
**(for example take 1 3 5 7 9 which are all odd numbers and total number is also odd that is 5 numbers. Then the sum is 25 which is an odd number) and**
**Sum of odd total of odd numbers is odd number (for example take 1 3 5 7 which are all odd numbers and total number is even that is 4 numbers. Then the sum is 16 which is an even number)**

Therefore, difference of two odd numbers is an even number
**Hence the number of even number is 0 for the given number N to be an even number.**

**Question 16: If |x| <=6; |y| <=4, then find the greatest possible value of |x/y|?**
Solution:

As |y| approaches 0 then |x/y| approach infinity
Hence the answer is infinity.

**<u>Question 17</u>: If twice the average of x, y and z, when divided by 7 gives remainder 1, then what is the remainder, when average x, y and z is divided by 7?**
<u>Solution</u>:

It will be easy to solve this by assuming a simple case
Given that the twice the average of x, y and z when divided by 7 leaves a remainder 1
=> 2(x+y+z)/3 = 7q+1
Let q =1
=> 2(x+y+z)/3 = 8
=> x+y+z = 12let the three numbers be 3, 4 and 5
Now, (x+y+z)/3 = 4
So, the remainder when (x+y+z)/3 divided by 7 is 4

**<u>Actual Procedure with out substitution method:</u>**

**2(x+y+z)/3 = 7q+1 ------> (1)**

Now 7q+1 will be an even number since on the LHS (x+y+z)/3 is multiplied by 2

And in the question it is asked to find out the remainder when (x+y+z)/3 is divided by 7 which means that (x+y+z)/3 is an integer.

Now if we consider 7q+1
It will even if and only if 7q is an odd number
Now,
7X1 = 7
7X2 = 14
7X3 = 21
7X4 = 28
Then from the above pattern we can conclude that q must be odd number
Any odd number can written in the form of 2k+1
Therefore,
q = 2k+1 ------------------> (2) where (k=0, 1, 2, 3.....)
Sub (2) in (1)
=> 2(x+y+z)/3 = 7(2k+1)+1
=> 2(x+y+z)/3 = 14k+8
=> (x+y+z)/3 = 7k+4
**Hence when (x+y+z)/3 is divided by 7 it will a remainder 4**

**<u>Question 18</u>: If a, b and c are 0, 1 or 2 and if a.$3^2$+ b.3 + c = 25, then what is the possible value of a + b + c?**
<u>Solution</u>:

Clearly, a and b cannot be less than 2 (since either of a or b equals 0 or 2 then we cannot get a sum of 25)
Possible combinations are a = 2, b = 2 and choose c accordingly
=> 2(9)+3(2)+c = 25
=> 24+c = 25

=> c =1
Therefore, a + b + c = 2 + 2 + 1 = 5

**Question 19: If a number, when divided by 5 gives remainder 3 and when divided by 4 gives remainder 2, then what is the remainder when the same number is divided by 10?**
**Solution:**

**This is how you have to come to conclusion for this question**
Let the number be 5q+3 = 4p+2
=> 5q+3 = 2(2p+1) ----->(1)
Since RHS is an even number which implies that LHS must also be even number
=> 5q+3 is an even number
(Sum of 2 odd numbers is an even number and sum of 1 odd and 1 even is an odd number)
Since 3 is an odd number 5q must also be an odd number
Now 5q can be odd if and only if q is oddAny odd number can be written in the form of 2k+1
q = 2k+1 ------>(2)
Now sub (2) in (1)
**=> 5(2k+1) + 3 = 10k+ 5 + 3**
**=> 10k +8**
**Hence the remainder when given number is divided by 10 is 8**

**Question 20: Given a series of odd numbers from 1 to n. Find the probability, that a number selected at random will be an odd number?(provided 'n' is an odd number)**
**Solution:**
Number of odd numbers = (n+1)/2
And number of even numbers = n-(n+1)/2 = (2n-n-1)/2 = (n-1)/2
Now the probability of that a number selected at random will be an odd number = (n+1)/2/n
**=> (n+1)/2n**

**Question 21: If $a_1$ = 2 and $a_{n+1}$=$(a_{n-1})^2$, then find the value of $a_{17}$?**
**Solution:**

It is given $a_1 = 2$

$a_{2+1} = (a_{2-1})^2$

$a_3 = (a_1)^2 = (2)^2 = 4$ → This can be written as $(2)^2$

$a_5 = (a_3)^2 = (4)^2 = 8$ → this can be written as $(2)^4$

$a_7 = (a_5)^2 = (8)^2 = 16$ → This can be written as $(2)^8$

Like wise, we need to do...........

Then we will get, $a_{17} = (2)^{256}$ = 2^(2^8)

**Question 22: If a1 = 2 and an+1=(an - 1)^2, then find the value of a17?**
**Solution:**

It is given a1 = 2
a 2 + 1 = ( a 2 – 1)2
a 3 = (a1)2 = (2)2 = 4 → This can be written as (2)2
a5 = (a3)2 = (4)2 = 8 → this can be written as (2)4

a 7 = (a5)2 = (8)2 = 16 → This can be written as (2)8
Like wise, we need to do...........Then we will get, a 17 = (2)256
The powers are like, 2 , 4 , 8 , 16 , 32 , 64, 128, 256...........
**Current values power = Previous values power * 2**

**Question 23: The product of prime factors of 300.**
**A. 15**
**B. 30**
**C. 45**
**& so on....**
**Solution:**

We need to find out the prime factors for 300
300 = 3 * 100 = 3 * 10 * 10 = 3 * 5 * 2 * 5 *2
Therefore, the product of the prime factors = 3 * 5 * 2 = 30 ( option B)

So, the answer is not the number itself

**Question 24: Given a series of numbers x, y, z, 0, 1, 1, 2, 3, 5, 8??.If every number in the series is sum of the proceeding two numbers, then what is value of x?**
**Solution:**

Acc to the condition
z + 0 = 1, means z = 1
y + 1 = 0, so y = -1
x – 1 = 1 , so x = 2
**Hence, x = 2**

**Question 25: Given a set of five numbers 27, 29, 35, 9, 25 on increasing each number by 'K' if the new mean of the set becomes 29.5, then what is the new median?**
**Solution:**

( 27 + k + 29 + k + 35 + k + 9 + k + 25 + k ) / 5 = 29.5
( 125 + 5 k ) = 147.5
5 k = 22.5
k = 4.5
Therefore, the set of new five numbers = (27 + 4.5) , (29 + 4.5) , (35 + 4.5) , (9 + 4.5) , (25 + 4.5)
= 31.5 , 33.5 , 39.5, 13.5 , 29.5
To find the median , we need to arrange the values in ascending order.
13.5, 29.5 , 31.5 , 33.5 , 39.5
**Therefore new median = 31.5**

**Question 26: If a1=2 and an+1= (an-1)^2, then what is the value of a15?**
**A. 28**
**B. 216**
**C. 232**
**D. 2128**
**E. 2256**
**Solution:**

This is same as “If a1 = 2 and an+1=(an - 1)^2, then find the value of a17?”
**Therefore, solution = 2128**

**<u>Question 27</u>: If $a_1$=2 and $a_{n+1}$= $(a_{n-1})^2$, then what is the value of $a_{15}$?**

**A. $2^8$ B. $2^{16}$ C. $2^{32}$ D. $2^{128}$ E. $2^{256}$**

**Answer is $2^{256}$**

**<u>Question 28</u>: Given 'n' is a positive integer. What is the least value of n, such that the product 12n should be a perfect square of some integer?**
**<u>Solution</u>:**

We should have different values of n and substitute in 12n to satisfy the condition.
Let , n = 1
12n = 12 ( It is not a perfect square)
Let n = 2
12n = 24 ( It is not a perfect square)
Let n = 3
12n = 36
it is the perfect square of another integer 6.
**Therefore, the least value of n = 3.**

**<u>Question 29</u>: (0.9/1.1) 2 + (1.1 /0.9)2**
**Col B: 2**
**<u>Solution</u>:**

Col A : (9/11)2 + ( 11/ 9)2 = (81/121) + (121/81) = 0.67 + 1.49 = 2.16
Col B : 2
**Therefore, Column A is greater.**

**<u>Question 30</u>: If the median of seven Consecutive integers is 2n+2, then find the Arithmetic mean of the sequence?**
**<u>Solution</u>:**

Remember : If we have an odd set of consecutive integer ( say, 3 consecutive integers or 5 consecutive integers or 7 consecutive integers or 9 consecutive integers, etc.,). In this case, the mean value and the median value will be same.
Since, the question talks about 7 consecutive integers and the median value is given.
The Arithmetic mean of the sequence = Median of the sequence.
**Therefore, A.M = 2n + 2**

**<u>Question 31</u>: If 'N' is a 3 digit number where hundreds place is 'x' and units place is 'y' then what will be the factor for N-100x-y?**
**A. 3 B. 4 C. 5 D. 6 E. 7**
**<u>Solution</u>:**
Case 1 : Let us take N as 131, x = 1 and y = 1,

then , N-100x-y = 131 – 100-1= 30, which is a factor of 3, 5 and 6.

Case 2 : Let us take N as 456, x=4 and y = 6 then, N-100x-y = 456 – 400 – 6 = 50 , which is a factor of 5

Case 3 : Let us take N as 142, x=1and y = 2

then, N-100x-y = 142 – 100 – 2 = 40 , which is a factor of 4 and 5.

From all these cases, what we infer is, for any number of N, the factor for N-100x-y will be 5.

**Answer is Option C (5)**

**Question 32: If 'S' is a set of all integers that are multiples of 3 & multiples of 5, provided it should be of 2 digits, then find the range of S?**
**A. 81 B. 77 C. 87 D. 89 E. 91**

**Solution:**

Multiples of 3 and Multiples of 5 ( condition : it should be of 2 digits)

Multiples of 3 = { 12 , 15 , 18 , 21 ,........................, 99}

Multiples of 5 = { 10, 15, 20, 25, ............................,95}

Therefore, S = { 10,12,15,18,..........................99}

Range = Maximum number – Minimum Number

Range of S = 99 – 10 = 89

**Answer : Option D (89)**

**Question 33: Find the number of possible values of x & y in the expression (5+x)/(7+y), so that the resultant ratio is 5:7 where x and y lie between 12 and 29?**

**Solution:**

(5+x)/(7+y) = 5/7

x and y should lie between 12 and 29

To Find : x and y

5+x must be a multiple of 5 , the possible values will be (5+0), (5+5), (5+10), (5+15),(5+20),(5+25), (5+30),.................

7+y must be a multiple of 7 , the possible values will be (7+0), (7+7), (7+14), (7+21),(7+28),(7+35), (7+42),.................

(5+x)/(7+y) can be (5+0)/(7+0) , (5+5)/(7+7), (5+10)/(7+14), (5+15)/(7+21) , (5+20)/(7+28) , (5+25)/(7+35) , (5+30)/(7+42)

All the above said are possible values that x and y can take, but

the condition given is x and y should lie between 12 and 29.

So , eliminating options, which does not lie in this range, we get

(5+15)/(7+21) and (5+20)/(7+28).

**Answer : x = 15 and y = 21 (or) x = 20 and y = 28**

**Question 34: Given the average of seven numbers as 35. When k is added to it, if the average of eight numbers remains 35, then what is the value of k?**

**Solution:**

(Total of 7 numbers ) / 7 = 35

Therefore, total of 7 numbers = 245

If k is added , then the average of 8 numbers remains 35

(245 + k ) / 8 = 35

245 + k = 280

k = 35

**Answer: the value of k is 35**

**Question 35: For n/12, what is the value of n whose remainder is odd integer?**

**Solution:**

n can take any value from { 13, 15, 17, 19, 21, 23,25,.....}

Therefore, Value cannot be determined

**Question 36: If 'x' and 'y' are integers between 12 and 30, then for (5+x)/(7+y) how many sets of x & y for the given expression will be having same ratio?**

**Solution:**

Same question as, " Find the number of possible values of x & y in the expression (5+x)/(7+y), so that the resultant ratio is 5:7 where x and y lie between 12 and 29?" , Solve by the same method.

**Question 37: Given five consecutive numbers, if the highest value of them is x, then what is the average of the numbers?**

**Solution:**

Five consecutive numbers with the highest value of x will be

(x – 4 ) , ( x – 3 ) , ( x – 2 ) , ( x – 1 ) , x

Average of these numbers = (x – 4 + x – 3 + x – 2 + x – 1 + x )/5

= (5x – 10 )/ 5

= x – 2

**Answer : Average of numbers = x -2**

**Question 38: Given N is a positive odd integer. If the number in the tens digit is double the digit at the units place then what is the value of N?**

**A. n > 90**

**B. 30 < N**

**C. N > 50**

**D. 30 < N < 50**

**Solution:**

If the number in the tens digit is double the digit at the units place and
N is a positive odd integer.
N can take only two values , 21 and 63.

**Answer : It does not fall in any of the options.**

**Question 39: Given three series**

**I: x, 2x, 3x, 4x, 5x**
**II: x, x+1, x+2, x+3**
**III: 1/x,1/x+1,1/x+2,1/x+3**
**Which of the series has same mean and median?**
**Solution:**

I: x, 2x, 3x, 4x, 5x
Mean = (x + 2x + 3x + 4x + 5x )/5 = 3x
Meadian = (n + 1 )/2 th term = 3rd term = 3x
Both are same.
II: x, x+1, x+2, x+3
Mean = (4x + 6 )/ 4 = (2x + 3 )/2
Median = 2.5th term = (2nd term + 3rd term ) / 2 = [(x+1) + (x+2) ] / 2 = (2x + 3)/2
Both are same.
III: 1/x,1/x+1,1/x+2,1/x+3
Mean : (4 + 6x)/4x = (2 + 3x )/2x
Median : 2.5th term = (2nd term + 3rd term ) / 2= (2 + 3x )/2x
Both are same
**Answer : For all the three options mean and median are same.**

**Question 40: If -10 < = X < = 6, then what is the maximum possible greatest value of -X^2+X^4?**
**Solution:**

Both the powers are even.
Therefore, negative values when powered with even values will turn into a positive value.
Hence, -X^2+X^4 = - (-10)2 + (-10)4 = -100 + 10000 = 9900
**Answer : The maximum possible greatest value of -X^2+X^4 = 9900**

**Question 41: If 'A' is three times of 'B' and 'B' is five times of 'C', then how many times is 'A' when compared to 'C'?**
**A.15**
**B.14C**
**C.15C**
**D.10C**
**Solution:**

A is three times B. This can be written as A = 3B ------> 1.
B is five times C. This can be written as B = 5C.
Plug in B = 5C in eqn 1.
A = 3(5C) = 15C.
A = 15C
**Answer : A is 15 times of C**

**Question 42: If there is a series in which the first number A1 is 4 and An+1 = (An - 3)^2, then what is the 25th number ?**
**(Here 1, n, n+1 are suffixes)**
**Solution:**

Here we have not given information about the complete sequence.
Given : $A1=4$ , A $(n+1)$= A$(n-3)$^2
Let n - 3 = 1, then n = 4
Hence we can find $A(4+1)=A5=A(4-3)$^2 =$A1$^2 =4^2

Let n-3 = 5, then n = 8
$A(8+1)= A9 = A(8–3)^2 = A5^2 = 4^4$
n – 3 = 9, then n = 12
$A(13)=4^8$
The sequence is 1, 5, 9, 13, 17, 21, 25,.....
**such that $A1=4$ , $A5=4^2$ , $A9=4^4$ , $A13=4^8$ , $A17=4^16$, $A21=4^32$ , $A25=4^64$**

**<u>Question 43</u>: The range of list-1 is 16 and range of list-2 is 10(approx values). If both the lists are combined then what will be the minimum value of their range?**
<u>Solution</u>:

The question is incomplete, it has not given any detail with regard to list – 1 and list – 2, Hence, it cannot be computed.

Let us take 2 cases for better understanding.

<u>Case 1</u> :Let list-1 contains numbers from 1 to 17 and list-2 contains 20 to 30

Here the range on list-1 is16 and range of list-2 is 10 and the minimum value of these two lists are 1 and 20 respectively.

If we combine both the lists, the minimum value will be 1 which comes from list-1.

<u>Case 2</u> : Let list-1 contains value from 5 to 21 and list -2 contains value from 2 to 12

Here also the range for list-1 is 16 and the range for list-2 is 10 and the minimum values are 5 and 2 respectively.

If we combine both the lists, the minimum value will be 2 which comes from list-2.

From these two cases, we can clearly say, that both the lists can have numerous combination of numbers and their minimum value will be changing accordingly ie the minimum value may come from any list.

**Hence, the question provided is insufficient to answer.**

**<u>Question 44</u>: if y= 2x + 3 , xy < 0 value of x lies between ?**
<u>Solution</u>:

To satisfy the condition xy<0, we have two options
→ If x is positive, y should be negative.
It means, x > 0 and 2x + 3 < 0
→ If x is negative, y should be positive.
It means , x < 0 and 2x + 3 > 0
The first case will not hold good, because, if x is positive, y will also be positive and not negative.
Therefore, first option is ruled out.
Thus second option alone holds good,
2x + 3 > 0
2x > -3
x > -3/2 -----------(1)
Thus, the second condition says, x < 0 ---------(2) , Hence from (1) and (2)

**Hence the range of x is -3/2 < x < 0.**

**<u>Question 45</u>: If integer defined as (-1)^n then which of following is applicable for integers a & b**

**I) a+b= a*b**
**II) (a+b) = a + b**
**III) a*b = (a)* (b)**
**a) both 1 &2 b)only 1  c) only 2 d) none e) all**

Solution:

The question should be If n is the integer, it is defined as (-1)^n.........
Then a = (-1)^a
b = (-1)^b
a + b = (-1)^(a+b)
= (-1)^a * (-1)^b
=  a * b
a*b = (-1)^a * (-1)^b
= (-1)^(a+b)
= a + b.
From this we can say that, only 1 is correct.
**Answer : Option b**

Question 46: **Given x1 , x2 , x3 can do a job together in 4 hrs if x1, x2 can do the same job in 6 hrs then how long it would take for x3 i do that job alone.**

Solution:

RATE  OF  X1 +X2+X3 = 1/4 -------------(1)
X1+X2 = 1/6------------(2)
Subtracting  (20 from (1)
**X3 = 1/12  SO IT TAKE 12 Hrs**

Question 47: **LCM of x and y is 24 and of z and w is 30 . what is LCM of x,y,z,w.**

Solution:

LCM  for x and y = 24 = 6 * 4 = 2 * 3 * 2 * 2
LCM  for z and w = 30 = 6 * 5 = 2 * 3 * 5

**Therefore, LCM for x,y,z,w =  120 ( it is nothing but, 2*3*2*2*5)**