Number System Questions for CAT

It is important for candidates to be aware of the CAT Questions on Number System. In order to make the candidates acquainted with the type of Number System Questions for CAT, we have provided the solution wise questions below on the said topic.

Question 1: How many three-digit numbers are greater than 100 and increase by 198 when the three digits are arranged in the reverse order?

Answer:70

Explanation: Let the numbers be of the form 100a+10b+c, where a, b, and c represent single digits. Then (100c+10b+a)-(100a+10b+c)=198 99c-99a=198 c-a = 2. Now, a can take the values 1-7. a cannot be zero as the initial number has 3 digits and cannot be 8 or 9 as then c would not be a single-digit number. Thus, there can be 7 cases. B can take the value of any digit from 0-9, as it does not affect the answer. Hence, the total cases will be 7*10=70.

Question 2: If 'x' is a whole number and 'y' is also a whole number. Then, (x + y)(x + y) is a

Answer: Whole Number

Explanation: Let us take x = 2 and y = 0
Then, (x + y)(x + y) = (2 + 0)(2 + 0) = 4
We can take multiple values and we will get that (x + y)(x + y) will be a whole number.

Question 3: P is a prime number and $(p^2 + 3)$ is also a prime number. The number of all such possible p's is

Answer: 1
Only one value of p can assume, which is 2 at P=2, $P^2 + 3 = 7$ which is also a prime number while all other P's are odd numbers, and hence their square is also an odd number. On adding 3, it will convert into an even number. But an even number except 2 is not a prime number.
$P^2 + 3 = $ an even number that can't be a prime number.

Question 4: a and b are irrational numbers such that a + b = q is a rational number, then a – b is

Answer: Always Irrational
Explanation:

Given a and b are irrational numbers.

And, a + b = q

Then, we know that

$a^2 - b^2 = (a + b)(a - b)$

$$\Rightarrow a - b = \frac{a^2 - b^2}{a + b}$$

$$\Rightarrow a - b = \frac{a^2 - b^2}{q}$$

Above term will always be irrational