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CAT Blitzkrieg

ALL CAT QUESTIONS FROM NUMBER THEORY - 2


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1. CAT 2019 – Slot II

How many pairs of (m,n) satisfy the equation $m^2 + 105 = n^2$?[TITA]

2. CAT 2019 – Slot II

In a six-digit number, the sixth, that is, the rightmost, digit is the sum of the first three digits, the fifth digit is the sum of the first two digits, the third digit is equal to the first digit, the second digit is twice the first digit and the fourth digit is the sum of fifth and sixth digits. Then, the largest possible value of the fourth digit is

[TITA]

3. CAT 2018 – Slot I

The number of integers x such that $0.25 \leq 2^x \leq 200$, and $2^x + 2$ is perfectly divisible by either 3 or 4, is

[TITA]

4. CAT 2018 – Slot II

If N and x are positive integers such that $N^N = 2^{160}$ and $N^2 + 2^N$ is an integral multiple of 2^x, then the largest possible x is

[TITA]

5. CAT 2017 – Slot II

The numbers 1, 2,..., and 9 are arranged in a 3 X 3 square grid in such a way that each number occurs once and the entries along each column, each row, and each of the two diagonals add up to the same value.

If the top left and the top right entries of the grid are 6 and 2, respectively, then the bottom middle entry is: [TITA]

6. CAT 2017 – Slot II

If the product of three consecutive positive integers is 15600 then the sum of the squares of these integers is

A. 1777
B. 1785
C. 1875
D. 1877

7. XAT 2022

A supplier receives orders from 5 different buyers. Each buyer places their order only on a Monday. The first buyer places the order after every 2 weeks, the second buyer, after every 6 weeks, the third buyer, after every 8 weeks, the fourth buyer, after every 4 weeks, and the fifth buyer, after every 3 weeks. It is known that on January 1st, which was a Monday, each of these five buyers placed an order with the supplier.

On how many occasions, in the same year, will these buyers place their orders together excluding the order placed on January 1st?

A. 3
B. 5
C. 1
D. 2
E. 4

8. XAT 2022

Nadeem's age is a two-digit number X, squaring which yields a three-digit number, whose last digit is Y. Consider the statements below:

Statement I: Y is a prime number

Statement II: Y is one-third of X

To determine Nadeem's age uniquely:

A. even taking I and II together are not sufficient.
B. either of I and II, by itself, is sufficient.
C. only I is sufficient, but II is not.
D. only II is sufficient, but I is not.
E. it is necessary and sufficient to take I and II together.

9. XAT 2020

A shop sells bags in three sizes: small, medium, and large. A large bag costs Rs.1000, a medium bag costs Rs.200, and a small bag costs Rs.50. Three buyers, Ashish, Banti, and Chintu, independently buy some numbers of these types of bags. The respective amounts spent by Ashish, Banti, and Chintu are equal. Put together, the shop sells 1 large bag, 15 small bags, and some medium bags to these three buyers. What is the minimum number of medium bags that the shop sells to them?

A. 7
B. 5
C. 9
D. 4
E. 10

10. XAT 2019

Two numbers a and b are inversely proportional to each other. If ‘a’ increases by 100%, then b decreases by:

A. 200%
B. 100%
C. 150%
D. 80%
E. 50%

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