

1. If x is an integer, what is the value of x ?

- (1) $|23x|$ is a prime number
- (2) $2\sqrt{x^2}$ is a prime number.

2. If a positive integer n has exactly two positive factors what is the value of n ?

- (1) $n/2$ is one of the factors of n
- (2) The lowest common multiple of n and $n + 10$ is an even number.

3. If $0 < x < y$ and x and y are consecutive perfect squares, what is the remainder when y is divided by x ?

- (1) Both x and y have 3 positive factors.
- (2) Both \sqrt{x} and \sqrt{y} are prime numbers

4. Each digit of the three-digit integer N is a multiple of 4, what is the value of K ?

- (1) The units digit of K is the least common multiple of the tens and hundreds digit of K
- (2) K is NOT a multiple of 3.

5. If a , b , and c are integers and $a < b < c$, are a , b , and c consecutive integers?

- (1) The median of $\{a!, b!, c!\}$ is an odd number.
- (2) $c!$ is a prime number

6. Set S consists of more than two integers. Are all the numbers in set S negative?

- (1) The product of any three integers in the list is negative
- (2) The product of the smallest and largest integers in the list is a prime number.

7. Is x the square of an integer?

- (1) When x is divided by 12 the remainder is 6
- (2) When x is divided by 14 the remainder is 2

8. Set A consist of 10 terms, each of which is a reciprocal of a prime number, is the median of the set less than $1/5$?

- (1) Reciprocal of the median is a prime number
- (2) The product of any two terms of the set is a terminating decimal

9. If $[x]$ denotes the greatest integer less than or equal to x for any number x , is $[a] + [b] = 1$?

- (1) $ab = 2$
- (2) $0 < a < b < 2$

10. If $N = 3^x \cdot 5^y$, where x and y are positive integers, and N has 12 positive factors, what is the value of N ?

- (1) 9 is NOT a factor of N
- (2) 125 is a factor of N

BONUS QUESTION:

11. If x and y are positive integers, is x a prime number?

(1) $|x - 2| < 2 - y$

(2) $x + y - 3 = |1 - y|$