1. The length of the diagonal of square S, as well as the lengths of the diagonals of rhombus R are integers. The ratio of the lengths of the diagonals is 15:11:9, respectively. Which of the following could be the difference between the area of square S and the area of rhombus R?

I. 63
II. 126
III. 252

A. I only
B. II only
C. III only
D. I and III only
E. I, II and III

2. Set S contains 7 different letters. How many subsets of set S, including an empty set, contain at most 3 letters?

A. 29
B. 56
C. 57
D. 63
E. 64

3. How many different subsets of the set {0, 1, 2, 3, 4, 5} do not contain 0?

A. 16
B. 27
C. 31
D. 32
E. 64

4. The functions f and g are defined for all the positive integers n by the following rule: f(n) is the number of perfect squares less than n and g(n) is the number of primes numbers less than n. If f(x) + g(x) = 16, then x is in the range:

A. 30 < x < 36
B. 30 < x < 37
C. 31 < x < 37
D. 31 < x < 38
E. 32 < x < 38

5. Which of the following is a factor of 18!+1?

A. 15
B. 17
C. 19
D. 33
E. 39

6. If the least common multiple of a positive integer x, 4^3 and 6^5 is 6^6. Then x can take how many values?

A. 1
B. 6
C. 7
D. 30
E. 36

7. The greatest common divisor of two positive integers is 25. If the sum of the integers is 350, then how many such pairs are possible?

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

8. The product of a positive integer x and 377,910 is divisible by 3,300, then the least value of x is:

A. 10
B. 11
C. 55
D. 110
E. 330

9. What is the 101st digit after the decimal point in the decimal representation of 1/3 + 1/9 + 1/27 + 1/37?

A. 0
B. 1
C. 5
D. 7
E. 8

10. If x is not equal to 0 and x^y=1, then which of the following must be true?

I. x=1
II. x=1 and y=0
III. x=1 or y=0

A. I only
B. II only
C. III only
D. I and III only
E. None