1

If x is a positive integer and z is a non-negative integer such that 2,066^z is a divisor of 3,176,793, what is the value of z^x - x^z?

A. -81
B. -1
C. 0
D. 1
E. It Cannot Be Determined

2

If 9x = 27^y, which of the following expresses x in terms of y?

A. 3^y
B. 3^(y-1)
C. 3^(2y-1)
D. 3^(2y-3)
E. 3^(3y-2)

3

The positive value of x that satisfies the equation (1 + 2x)^5 = (1 + 3x)^4 is between

A. 0 and 0.5
B. 0.5 and 1
C. 1 and 1.5
D. 1.5 and 2
E. 2 and 2.5

4

The function p(n) on non-negative integer n is defined in the following way: the units digit of n is the exponent of 2 in the prime factorization of p(n), the tens digit is the exponent of 3, and in general, for positive integer k, the digit in the 10^(k–1) th place of n is the exponent on the kth smallest prime (compared to the set of all primes) in the prime factorization of p(n). For instance, p(102) = 20, since 20 = (5^1)(3^0)(2^2). What is the smallest positive integer that is not equal to p(n) for any permissible n?

(A) 1
(B) 29
(C) 31
(D) 1,024
(E) 2,310

5

4^x + 4^-x = 2 What is the value of x?

A. -1
B. -1/2
C. 0
D. 1/2
E. 1