16

SOLVE FOR X

2003A 11. The sum of the two 5-digit numbers $AMC10$ and $AMC12$ is 123422. What is $A + M + C$?

(A) 10 (B) 11 (C) 12 (D) 13 (E) 14

2010A

11. The length of the interval of solutions of the inequality $a \leq 2x + 3 \leq b$ is 10. What is $b - a$?

(A) 6 (B) 10 (C) 15 (D) 20 (E) 30

2002B

13. Find the value(s) of x such that $8xy - 12y + 2x - 3 = 0$ is true for all values of y.

(A) $\frac{2}{3}$ (B) $\frac{3}{2}$ or $-\frac{1}{4}$ (C) $-\frac{2}{3}$ or $-\frac{1}{4}$ (D) $\frac{3}{2}$ (E) $-\frac{3}{2}$ or $-\frac{1}{4}$

2005A

13. How many positive integers n satisfy the following condition:

$$(130n)^{50} > n^{100} > 2^{200} \ ?$$

(A) 0 (B) 7 (C) 12 (D) 65 (E) 125

2009A

13. Suppose that $P = 2^m$ and $Q = 3^n$. Which of the following is equal to 12^{mn} for every pair of integers (m, n)?

(A) P^2Q **(B)** P^nQ^m **(C)** P^nQ^{2m} **(D)** $P^{2m}Q^n$ **(E)** $P^{2n}Q^m$

2010B

13. What is the sum of all the solutions of $x = |2x - |60 - 2x||$?

(A) 32 **(B)** 60 **(C)** 92 **(D)** 120 **(E)** 124

2014B

12. The largest divisor of 2,014,000,000 is itself. What is its fifth largest divisor?

(A) 125,875,000 **(B)** 201,400,000 **(C)** 251,750,000 **(D)** 402,800,000
(E) 503,500,000

2003B 14. Given that $3^8 \cdot 5^2 = a^b$, where both a and b are positive integers, find the smallest possible value for $a + b$.

(A) 25 **(B)** 34 **(C)** 351 **(D)** 407 **(E)** 900

2018B 11. Which of the following expressions is never a prime number when p is a prime number?

(A) $p^2 + 16$ **(B)** $p^2 + 24$ **(C)** $p^2 + 26$ **(D)** $p^2 + 46$

(E) $p^2 + 96$

2018A 12. How many ordered pairs of real numbers (x, y) satisfy the following system of equations?

$$x + 3y = 3$$
$$\big|\, |x| - |y| \,\big| = 1$$

(A) 1 **(B)** 2 **(C)** 3 **(D)** 4 **(E)** 8

2000

15. Two non-zero real numbers, a and b, satisfy $ab = a - b$. Find a possible value of $\frac{a}{b} + \frac{b}{a} - ab$.

(A) -2 **(B)** $-\frac{1}{2}$ **(C)** $\frac{1}{3}$ **(D)** $\frac{1}{2}$ **(E)** 2

2004A

15. Given that $-4 \leq x \leq -2$ and $2 \leq y \leq 4$, what is the largest possible value of $(x+y)/x$?

(A) -1 **(B)** $-\frac{1}{2}$ **(C)** 0 **(D)** $\frac{1}{2}$ **(E)** 1