15

SOLVE FOR X

2009A

16. Let a, b, c, and d be real numbers with $|a - b| = 2$, $|b - c| = 3$, and $|c - d| = 4$. What is the sum of all possible values of $|a - d|$?

(A) 9   (B) 12   (C) 15   (D) 18   (E) 24

2002A

16. If $a + 1 = b + 2 = c + 3 = d + 4 = a + b + c + d + 5$, then $a + b + c + d$ is

(A) -5 (B) $-10/3$ (C) $-7/3$ (D) $5/3$ (E) 5

2005B

17. Suppose that $4^a = 5$, $5^b = 6$, $6^c = 7$, and $7^d = 8$. What is $a \cdot b \cdot c \cdot d$?

(A) 1   (B) $\dfrac{3}{2}$ (C) 2   (D) $\dfrac{5}{2}$ (E) 3

2007A 17. Suppose that m and n are positive integers such that $75m = n^3$. What is the minimum possible value of $m + n$?

(A) 15   (B) 30   (C) 50   (D) 60   (E) 5700

2012A 17. Let a and b be relatively prime integers with $a > b > 0$ and $\frac{a^3 - b^3}{(a-b)^3} = \frac{73}{3}$. What is $a - b$?

(A) 1   (B) 2   (C) 3   (D) 4   (E) 5

2003B 18. What is the largest integer that is a divisor of

$$(n + 1)(n + 3)(n + 5)(n + 7)(n + 9)$$

for all positive even integers n?

(A) 3   (B) 5   (C) 11   (D) 15   (E) 165

2000 20. Let A, M, and C be nonnegative integers such that $A + M + C = 10$. What is the maximum value of $A \cdot M \cdot C + A \cdot M + M \cdot C + C \cdot A$?

(A) 49   (B) 59   (C) 69   (D) 79   (E) 89

2002B 20. Let $a, b,$ and c be real numbers such that $a - 7b + 8c = 4$ and $8a + 4b - c = 7$. Then $a^2 - b^2 + c^2$ is

(A) 0   (B) 1   (C) 4   (D) 7   (E) 8

2018B

20. A function f is defined recursively by $f(1) = f(2) = 1$ and

$$f(n) = f(n-1) - f(n-2) + n$$

for all integers $n \geq 3$. What is $f(2018)$?

(A) 2016   (B) 2017   (C) 2018   (D) 2019   (E) 2020