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ALGEBRA WORD PROBLEMS

2000

11. Two different prime numbers between 4 and 18 are chosen. When their sum is subtracted from their product, which of the following number could be obtained?

(A) 21   (B) 60   (C) 119   (D) 180   (E) 231

2001

12. Suppose that n is the product of three consecutive integers and that n is divisible by 7. Which of the following is not necessarily a divisor of n?

(A) 6   (B) 14   (C) 21   (D) 28   (E) 42

2002B

11. The product of three consecutive positive integers is 8 times their sum. What is the sum of their squares?

(A) 50   (B) 77   (C) 110   (D) 149   (E) 194

2009B

11. How many 7 digit palindromes (numbers that read the same backward as forward) can be formed using the digits 2, 2, 3, 3, 5, 5, 5?

(A) 6   (B) 12   (C) 24   (D) 36   (E) 48

2012A

12. A year is a leap year if and only if the year number is divisible by 400 (such as 2000) or is divisible by 4 but not by 100 (such as 2012). The 200th anniversary of the birth of novelist Charles Dickens was celebrated on February 7, 2012, a Tuesday. On what day of the week was Dickens born?

(A) Friday   (B) Saturday   (C) Sunday   (D) Monday   (E) Tuesday

2003A

13. The sum of three numbers is 20. The first is 4 times the sum of the other two. The second is seven times the third. What is the product of all three?

(A) 28   (B) 40   (C) 100   (D) 400   (E) 800

2005B

13. How many numbers between 1 and 2005 are integer multiples of 3 or 4 but not 12?

(A) 501   (B) 668   (C) 835   (D) 1002   (E) 1169

2013A

13. How many three-digit numbers are not divisible by 5, have digits that sum to less than 20, and have the first digit equal to the third digit?

(A) 52   (B) 60   (C) 66   (D) 68   (E) 70

2001

13. A telephone number has the form $ABC - DEF - GHIJ$, where each letter represents a different digit. The digits in each part of the number are in decreasing order; that is, $A > B > C$, $D > E > F$, and $G > H > I > J$. Furthermore, D, E, and F are consecutive even digits; G, H, I, and J are consecutive odd digits; and $A + B + C = 9$. Find A.

(A) 4   (B) 5   (C) 6   (D) 7   (E) 8

2004B

13. In the United States, coins have the following thicknesses: penny, 1.55 mm; nickel, 1.95 mm; dime, 1.35 mm; quarter, 1.75 mm. If a stack of these coins is exactly 14 mm high, how many coins are in the stack?

(A) 7   (B) 8   (C) 9   (D) 10   (E) 11

2016B

13. At Megapolis Hospital one year, multiple-birth statistics were as follows: Sets of twins, triplets, and quadruplets accounted for 1000 of the babies born. There were four times as many sets of triplets as sets of quadruplets, and three times as many sets of twins as sets of triplets. How many of these 1000 babies were in sets of quadruplets?

(A) 25   (B) 40   (C) 64   (D) 100   (E) 160

2003A

14. Let n be the largest integer that is the product of exactly 3 distinct prime numbers, d, e and $10d + e$, where d and e are single digits. What is the sum of the digits of n?

(A) 12   (B) 15   (C) 18   (D) 21   (E) 24

2014B

14. Danica drove her new car on a trip for a whole number of hours, averaging 55 miles per hour. At the beginning of the trip, abc miles was displayed on the odometer, where abc is a 3-digit number with $a \geq 1$ and $a + b + c \leq 7$. At the end of the trip, the odometer showed cba miles. What is $a^2 + b^2 + c^2$?

(A) 26   (B) 27   (C) 36   (D) 37   (E) 41

2002B

15. The positive integers A, B, $A - B$, and $A + B$ are all prime numbers. The sum of these four primes is

(A) even   (B) divisible by 3   (C) divisible by 5   (D) divisible by 7

(E) prime

2010B

15. On a 50-question multiple choice math contest, students receive 4 points for a correct answer, 0 points for an answer left blank, and -1 point for an incorrect answer. Jesse's total score on the contest was 99. What is the maximum number of questions that Jesse could have answered correctly?

(A) 25   (B) 27   (C) 29   (D) 31   (E) 33

2015A

15. Consider the set of all fractions $\frac{x}{y}$, where x and y are relatively prime positive integers. How many of these fractions have the property that if both numerator and denominator are increased by 1, the value of the fraction is increased by 10%?

(A) 0   (B) 1   (C) 2   (D) 3   (E) infinitely many

2015B

15. The town of Hamlet has 3 people for each horse, 4 sheep for each cow, and 3 ducks for each person. Which of the following could not possibly be the total number of people, horses, sheep, cows, and ducks in Hamlet?

(A) 41   (B) 47   (C) 59   (D) 61   (E) 66

2016B

15. All the numbers $1, 2, 3, 4, 5, 6, 7, 8, 9$ are written in a 3×3 array of squares, one number in each square, in such a way that if two numbers are consecutive then they occupy squares that share an edge. The numbers in the four corners add up to 18. What number is in the center?

(A) 5   (B) 6   (C) 7   (D) 8   (E) 9