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ARITHMETIC

2002A

1. The ratio $\frac{10^{2000}+10^{2002}}{10^{2001}+10^{2001}}$ is closest to which of the following numbers?

(A) 0.1 (B) 0.2 (C) 1 (D) 5 (E) 10

2002B

1. The ratio $\frac{2^{2001} \cdot 3^{2003}}{6^{2002}}$ is

(A) $\frac{1}{6}$ (B) $\frac{1}{3}$ (C) $\frac{1}{2}$ (D) $\frac{2}{3}$ (E) $\frac{3}{2}$

2003B 1. Which of the following is the same as

$$\frac{2-4+6-8+10-12+14}{3-6+9-12+15-18+21}?$$

(A) -1 (B) $-\frac{2}{3}$ (C) $\frac{2}{3}$ (D) 1 (E) $\frac{14}{3}$

2006B

1. What is $(-1)^1 + (-1)^2 + \cdots + (-1)^{2006}$?

(A) -2006 **(B)** -1 **(C)** 0 **(D)** 1 **(E)** 2006

2010B

1. What is $100(100-3) - (100 \cdot 100 - 3)$?

(A) $-20{,}000$ **(B)** $-10{,}000$ **(C)** -297 **(D)** -6 **(E)** 0

2015A

1. What is the value of $(2^0 - 1 + 5^2 + 0)^{-1} \times 5$?

(A) -125 **(B)** -120 **(C)** $\frac{1}{5}$ **(D)** $\frac{5}{24}$ **(E)** 25

2015B

1. What is the value of $2 - (-2)^{-2}$?

(A) -2 **(B)** $\frac{1}{16}$ **(C)** $\frac{7}{4}$ **(D)** $\frac{9}{4}$ **(E)** 6

2017A

1. What is the value of $(2(2(2(2(2(2+1)+1)+1)+1)+1)+1)+1$?

(A) 70 **(B)** 97 **(C)** 127 **(D)** 159 **(E)** 729

2016A

1. What is the value of $\frac{11!-10!}{9!}$?

(A) 99 **(B)** 100 **(C)** 110 **(D)** 121 **(E)** 132

2018A

1. What is the value of

$$\left(\left((2+1)^{-1}+1\right)^{-1}+1\right)^{-1}+1?$$

(A) $\frac{5}{8}$ **(B)** $\frac{11}{7}$ **(C)** $\frac{8}{5}$ **(D)** $\frac{18}{11}$ **(E)** $\frac{15}{8}$

2002B

2. For the nonzero numbers a, b, and c, define

$$(a,b,c)=\frac{abc}{a+b+c}.$$

Find $(2,4,6)$.

(A) 1 **(B)** 2 **(C)** 4 **(D)** 6 **(E)** 24

2000

2. $2000(2000^{2000}) =$

(A) 2000^{2001} **(B)** 4000^{2000} **(C)** 2000^{4000}

(D) $4{,}000{,}000^{2000}$ **(E)** $2000^{4{,}000{,}000}$

2008B

3. Assume that x is a positive real number. Which is equivalent to $\sqrt[3]{x\sqrt{x}}$?

(A) $x^{1/6}$ **(B)** $x^{1/4}$ **(C)** $x^{3/8}$ **(D)** $x^{1/2}$ **(E)** x

2016B

3. Let $x = -2016$. What is the value of $\Big|\,\big|\,|x| - x\,\big| - |x|\,\Big| - x$?

(A) -2016 **(B)** 0 **(C)** 2016 **(D)** 4032 **(E)** 6048

2002B

4. What is the value of

$$(3x-2)(4x+1) - (3x-2)4x + 1$$

when $x = 4$?

(A) 0 **(B)** 1 **(C)** 10 **(D)** 11 **(E)** 12

2011A

4. Let X and Y be the following sums of arithmetic sequences:

$$X = 10 + 12 + 14 + \cdots + 100,$$
$$Y = 12 + 14 + 16 + \cdots + 102.$$

What is the value of $Y - X$?

(A) 92 **(B)** 98 **(C)** 100 **(D)** 102 **(E)** 112

2009A

5. What is the sum of the digits of the square of $111{,}111{,}111$?

(A) 18 **(B)** 27 **(C)** 45 **(D)** 63 **(E)** 81