UNIT 21 EXERCISES 6-10

SEQUENCE

2003B

6. The second and fourth terms of a geometric sequence are 2 and 6. Which of the following is a possible first term?

(A) $-\sqrt{3}$ (B) $-\dfrac{2\sqrt{3}}{3}$ (C) $-\dfrac{\sqrt{3}}{3}$ (D) $\sqrt{3}$ (E) 3

2016A

6. A triangular array of 2016 coins has 1 coin in the first row, 2 coins in the second row, 3 coins in the third row, and so on up to N coins in the Nth row. What is the sum of the digits of N?

(A) 6   (B) 7   (C) 8   (D) 9   (E) 10

2007A

7. Let $a, b, c, d,$ and e be five consecutive terms in an arithmetic sequence, and suppose that $a + b + c + d + e = 30$. Which of the following can be found?

(A) a (B) b (C) c (D) d (E) e

2009A

7. The first three terms of an arithmetic sequence are $2x - 3$, $5x - 11$, and $3x + 1$ respectively. The nth term of the sequence is 2009. What is n?

(A) 255   (B) 502   (C) 1004   (D) 1506   (E) 8037

2012A

7. Mary divides a circle into 12 sectors. The central angles of these sectors, measured in degrees, are all integers and they form an arithmetic sequence. What is the degree measure of the smallest possible sector angle?

(A) 5   (B) 6   (C) 8   (D) 10   (E) 12

2013A

7. The sequence $S_1, S_2, S_3, \ldots, S_{10}$ has the property that every term beginning with the third is the sum of the previous two. That is,

$$S_n = S_{n-2} + S_{n-1} \text{ for } n \geq 3.$$

Suppose that $S_9 = 110$ and $S_7 = 42$. What is S_4?

(A) 4   (B) 6   (C) 10   (D) 12   (E) 16

2014A

7. The first three terms of a geometric progression are $\sqrt{3}$, $\sqrt[3]{3}$, and $\sqrt[6]{3}$. What is the fourth term?

(A) 1   (B) $\sqrt[7]{3}$ (C) $\sqrt[8]{3}$ (D) $\sqrt[9]{3}$ (E) $\sqrt[10]{3}$

1999

8. At the end of 1994 Walter was half as old as his grandmother. The sum of the years in which they were born is 3838. How old will Walter be at the end of 1999?

(A) 48   (B) 49   (C) 53   (D) 55   (E) 101

2004B 8. A grocer makes a display of cans in which the top row has one can and each lower row has two more cans than the row above it. If the display contains 100 cans, how many rows does it contain?

(A) 5   (B) 8   (C) 9   (D) 10   (E) 11

2011A 8. In the eight-term sequence A, B, C, D, E, F, G, H, the value of C is 5 and the sum of any three consecutive terms is 30. What is $A + H$?

(A) 17   (B) 18   (C) 25   (D) 26   (E) 43

2002B 9. If a, b, c, d are positive real numbers such that a, b, c, d form an increasing arithmetic sequence and a, b, d form a geometric sequence, then $\dfrac{a}{d}$ is

(A) $\dfrac{1}{12}$ (B) $\dfrac{1}{6}$ (C) $\dfrac{1}{4}$ (D) $\dfrac{1}{3}$ (E) $\dfrac{1}{2}$

2018B 9. What is

$$\sum_{i=1}^{100}\sum_{j=1}^{100}(i+j)?$$

(A) 100,100   (B) 500,500   (C) 505,000   (D) 1,001,000

(E) 1,010,000

2005B   10. The first term of a sequence is 2005. Each succeeding term is the sum of the cubes of the digits of the previous term. What is the 2005th term of the sequence?

(A) 29   (B) 55   (C) 85   (D) 133   (E) 250

2010A   10. The first four terms of an arithmetic sequence are $p, 9, 3p - q$, and $3p + q$. What is the 2010th term of this sequence?

(A) 8041   (B) 8043   (C) 8045   (D) 8047   (E) 8049