

**A2.A.34: Sigma Notation: Represent the sum of a series, using sigma notation**

- 1 Which summation represents  
 $5 + 7 + 9 + 11 + \dots + 43$ ?

1)  $\sum_{n=5}^{43} n$

2)  $\sum_{n=1}^{20} (2n+3)$

3)  $\sum_{n=4}^{24} (2n-3)$

4)  $\sum_{n=3}^{23} (3n-4)$

- 3 Which expression represents the sum of the  
sequence 3, 5, 7, 9, 11?

1)  $\sum_{n=0}^5 (2n+1)$

2)  $\sum_{n=1}^5 3n$

3)  $\sum_{n=1}^5 (3n+1)$

4)  $\sum_{n=1}^5 (2n+1)$

- 2 Mrs. Hill asked her students to express the sum  
 $1 + 3 + 5 + 7 + 9 + \dots + 39$  using sigma notation.  
Four different student answers were given. Which  
student answer is correct?

1)  $\sum_{k=1}^{20} (2k-1)$

2)  $\sum_{k=2}^{40} (k-1)$

3)  $\sum_{k=-1}^{37} (k+2)$

4)  $\sum_{k=1}^{39} (2k-1)$

- 4 Which expression is equivalent to the sum of the  
sequence 6, 12, 20, 30?

1)  $\sum_{n=4}^7 2^n - 10$

2)  $\sum_{n=3}^6 \frac{2n^2}{3}$

3)  $\sum_{n=2}^5 5n - 4$

4)  $\sum_{n=2}^5 n^2 + n$

- 5 Jonathan's teacher required him to express the sum  $\frac{2}{3} + \frac{3}{4} + \frac{4}{5} + \frac{5}{6} + \frac{6}{7}$  using sigma notation.

Jonathan proposed four possible answers. Which of these four answers is *not* correct?

1)  $\sum_{k=3}^7 \frac{k-1}{k}$

2)  $\sum_{k=1}^5 \frac{k}{k+1}$

3)  $\sum_{k=1}^5 \frac{k+1}{k+2}$

4)  $\sum_{k=2}^6 \frac{k}{k+1}$

- 6 A jogger ran  $\frac{1}{3}$  mile on day 1, and  $\frac{2}{3}$  mile on day 2, and  $1\frac{1}{3}$  miles on day 3, and  $2\frac{2}{3}$  miles on day 4, and this pattern continued for 3 more days. Which expression represents the total distance the jogger ran?

1)  $\sum_{d=1}^7 \frac{1}{3} (2)^{d-1}$

2)  $\sum_{d=1}^7 \frac{1}{3} (2)^d$

3)  $\sum_{d=1}^7 2 \left( \frac{1}{3} \right)^{d-1}$

4)  $\sum_{d=1}^7 2 \left( \frac{1}{3} \right)^d$

- 7 The expression  $1 + \sqrt{2} + \sqrt[3]{3}$  is equivalent to

1)  $\sum_{n=1}^3 \sqrt{n}$

2)  $\sum_{n=0}^3 n^n$

3)  $\sum_{n=1}^3 n^{-n}$

4)  $\sum_{n=1}^3 n^{\frac{1}{n}}$

- 8 Express the sum  $7 + 14 + 21 + 28 + \dots + 105$  using sigma notation.

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**Answer Section**

1 ANS: 2 REF: 061205a2

2 ANS: 1 REF: 061025a2

3 ANS: 4 REF: 060807b

4 ANS: 4 REF: 011504a2

5 ANS: 2

$$\sum_{k=1}^5 \frac{k}{k+1} = \frac{1}{2} + \frac{2}{3} + \frac{3}{4} + \frac{4}{5} + \frac{5}{6}.$$

REF: 080614b

6 ANS: 1 REF: 061420a2

7 ANS: 4

$$\sum_{n=1}^3 \frac{1}{n^n} = 1^{\frac{1}{1}} + 2^{\frac{1}{2}} + 3^{\frac{1}{3}} = 1 + \sqrt{2} + \sqrt[3]{3}$$

REF: 060714b

8 ANS:

$$\sum_{n=1}^{15} 7n$$

REF: 081029a2