

A2.A.35: Series 2: Determine the sum of the first n terms of an arithmetic or geometric series

- 1 The sum of the first eight terms of the series $3 - 12 + 48 - 192 + \dots$ is
 1) $-13,107$
 2) $-21,845$
 3) $-39,321$
 4) $-65,535$

2 Find the value of $\sum_{x=0}^2 2^x$.

3 Evaluate: $\sum_{k=1}^4 2^{k-1}$

4 Find the value of $\sum_{x=0}^2 9^x$.

5 What is the value of $\sum_{k=0}^2 3(2)^k$?

- 1) 15 3) 21
2) 19 4) 43

- 6 A ball is dropped from a height of 8 feet and allowed to bounce. Each time the ball bounces, it bounces back to

half its previous height. The vertical distance the ball travels, d , is given by the formula $d = 8 + 16 \sum_{k=1}^n \left(\frac{1}{2} \right)^k$,

where n is the number of bounces. Based on this formula, what is the total vertical distance that the ball has traveled after four bounces?

- 1) 8.9 ft
- 2) 15.0 ft
- 3) 22.0 ft
- 4) 23.0 ft

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Answer Section

1 ANS: 3

$$S_8 = \frac{3(1 - (-4)^8)}{1 - (-4)} = \frac{196,605}{5} = -39,321$$

REF: 061304a2

2 ANS:
7

REF: 089706siii

3 ANS:
15

REF: 010108siii

4 ANS:
91

REF: 089511siii

5 ANS: 3

$$S_n = \frac{a_1(1 - r^n)}{1 - r}$$

$$S_3 = \frac{3(1 - 2^3)}{1 - 2} = 21$$

REF: 080904b

6 ANS: 4

$$S_n = \frac{a_1(1 - r^n)}{1 - r}$$

$$S_4 = \frac{\frac{1}{2}(1 - (\frac{1}{2})^4)}{1 - \frac{1}{2}} = \frac{15}{16} \cdot 8 + 16(\frac{15}{16}) = 23.$$

REF: 080418b