F.BF.B.6: Series 2

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

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

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

4 What is the value of $\displaystyle\sum_{k=0}^{2} 3(2)^k$?
   1) 15
   2) 19
   3) 21
   4) 43

5 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 $d = 8 + 16\displaystyle\sum_{k=1}^{n}\left(\frac{1}{2}\right)^k$, 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:
    7

    REF: 089706siii
2   ANS:
    15

    REF: 010108siii
3   ANS:
    91

    REF: 089511siii
4   ANS: 3

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

$$s_3 = \frac{3(1 - 2^3)}{1 - 2} = 21$$

    REF: 080904b
5   ANS: 4

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

$$s_4 = \frac{\frac{1}{2}(1 - (\frac{1}{2})^4)}{1 - \frac{1}{2}} = \frac{15}{16} \cdot \quad 8 + 16(\frac{15}{16}) = 23.$$

    REF: 080418b