

Summation Notation (or Sigma Notation)

In 1 – 8, evaluate the sum.

1. $\sum_{i=0}^4 23i^2$

2. $\sum_{i=2}^4 3^{i+1}$

3. $2 \sum_{k=1}^6 \sin\left(\frac{k\pi}{4}\right)$

4. $\sum_{k=1}^3 \left(\frac{2k+3}{k}\right)$

5. $\sum_{b=0}^3 (2 - bi)$, where $i = \sqrt{-1}$

6. $\sum_{r=4}^7 {}_{11}C_r$

7. $\frac{1}{3} \sum_{n=0}^5 n!$

8. $\sum_{m=1}^3 (2m-1)^{m-1}$

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