You must show your work to get full credit.

1. Find $S = \sum_{k=4}^{8}(2k - 9)^2$. $S =$ _____

2. Find the sum of the geometric series
$$S = 10 + 10x^2 + 10x^4 + \cdots + 10x^{2n}$$
$$S = \text{_____}$$

3. Factor $x^3 - 8$. $x^3 - 8 =$ _____

4. Find the sum of the arithmetic series
$$S = 1 + 5 + 9 + 13 + \cdots + 29$$
$$S = \text{_____}$$