

Summation Notation Practice

Name Key

Algebra II

Hour _____

Create the series represented by the summation notation.

1. $\sum_{n=1}^{10} 2n - 5$
 $2(1) - 5$
 $2(2) - 5$
 $2(3) - 5$
 $2(4) - 5$
-3, -1, 1, 3, 5, 7, 9, 11, 13, 15

2. $\sum_{n=1}^7 -3n - 2$ -5, -8, -11, -14, -17, -20, -23
 $-3(1) - 2 = -5$
 $-3(2) - 2 = -8$
 $-3(3) - 2 = -11$

3. $\sum_{n=1}^6 -6 + 5n$
 $-6 + 5(1)$
 $-6 + 5(2)$
 $-6 + 5(3)$
-1, 4, 9, 14, 19, 24

4. $\sum_{n=1}^{10} 2 \cdot 4^{n-1}$
 $2 \cdot 4^{1-1} = 2$
 $2 \cdot 4^{2-1} = 8$
 $2 \cdot 4^{3-1} = 32$
 $2 \cdot 4^{4-1} = 128$
2, 8, 32, 128, 512, 2048, 8192, 32768
131,072; 524,288

5. $\sum_{n=1}^7 -1 \cdot 3^{n-1}$
 $-1 \cdot 3^{1-1}$
 $-1 \cdot 3^{2-1}$
-1, -3, -9, -27, -81, -243, -729

6. $\sum_{n=1}^5 3 \cdot \left(\frac{1}{2}\right)^{n-1}$
 $3 \cdot \frac{1}{2}^{1-1}$
 $3 \cdot \frac{1}{2}^{2-1}$
3, 1.5, 0.75, 0.375, 0.1875

Evaluate each series represented by the summation notation.

7. $\sum_{n=1}^{10} -2n + 5$
 $a_1 = -2(1) + 5$
 $a_{10} = -2(10) + 5$
 $\frac{n}{2}(a_1 + a_n)$
 $\frac{10}{2}(3 + -15)$
S₁₀ = -60

8. $\sum_{n=1}^7 \frac{1}{2}n + 5$
 $a_1 = \frac{1}{2}(1) + 5$
 $a_7 = \frac{1}{2}(7) + 5$
 $\frac{n}{2}(a_1 + a_n)$
 $\frac{7}{2}(5.5 + 8.5)$
S₇ = 49

9. $\sum_{n=5}^{16} -6 + 5n$
 $a_5 = -6 + 5(5)$
 $a_{16} = -6 + 5(16)$
 $\frac{n}{2}(a_1 + a_n)$
 $\frac{12}{2}(19 + 74)$
S₁₂ = 558

10. $\sum_{n=1}^{10} 2 \cdot 2^{n-1}$
 $a_1(1 - r^n)$
 $\frac{2(1 - 2^{10})}{(1 - 2)}$
S₁₀ = 2046

11. $\sum_{n=10}^{17} -1 \cdot 3^{n-1}$
 $a_1(1 - r^n)$
 $\frac{-1(1 - 3^8)}{(1 - 3)}$
S₈ = -3280

12. $\sum_{n=1}^5 -2 \cdot \left(\frac{1}{2}\right)^{n-1}$
 $a_1(1 - r^n)$
 $\frac{-2(1 - \frac{1}{2}^5)}{(1 - \frac{1}{2})}$
S₅ = -3.875