

Sigma Notation Worksheet

1. Write the series corresponding to each expression.

(a)  $\sum_{k=1}^5 (k+3)$

(b)  $\sum_{k=3}^7 (2)^{k-1}$

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

2. Write each series using sigma notation.

(a)  $3 + 12 + 48 + 192 + 768$

(b)  $24 + 8 + \frac{8}{3} + \frac{8}{9}$

3. Evaluate the following.

(a)  $\sum_{k=2}^6 2^{k-1}$

(b)  $\sum_{k=3}^7 3^{2k-3}$

(c)  $\sum_{k=2}^{10} 2\left(\frac{1}{2}\right)^{k-2}$

4. Write the series corresponding to each expression.

(a)  $\sum_{k=1}^4 a^k$

(b)  $\sum_{k=2}^5 ka^k$

(c)  $\sum_{k=2}^4 \log_2 k^k$

5. Write each series using sigma notation.

(a)  $6 + 18 + 54 + \dots$

(b)  $3 + 6 + 12 + \dots + 768$

6. Evaluate the following.

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

(b)  $\sum_{k=1}^5 2\left(\frac{1}{2}\right)^{1-2k}$

7. How many terms are in the following series?

(a)  $\sum_{k=6}^{25} 2(3)^{2k}$

(b)  $\sum_{k=11}^{47} 2 \log(k-1)$

8. Find the middle term of the following series.

$$\sum_{k=6}^{22} (2k-3)$$

**Answers:**

1. (a)  $4 + 5 + 6 + 7 + 8$

(b)  $16 + 32 + 64 + 128 + 256$

(c)  $\frac{2}{9} + \frac{2}{27} + \frac{2}{81}$

2. (a)  $\sum_{k=1}^5 3(4)^{k-1}$

(b)  $\sum_{k=1}^4 24\left(\frac{1}{3}\right)^{k-1}$

3. (a) 62

(b) 199287

(c)  $\frac{511}{128}$

4. (a)  $a^1 + a^2 + a^3 + a^4$

(b)  $2a^2 + 3a^3 + 4a^4 + 5a^5$

(c)  $2\log_2 2 + 3\log_2 3 + 4\log_2 4$

5. (a)  $\sum_{k=1}^{10} 6(3)^{k-1}$

(b)  $\sum_{k=1}^{10} 3(2)^{k-1}$

6. (a)  $\frac{1}{2}$

(b) 1364

7. (a) 20

(b) 37

8. 25