

# Sigma Notation Review Questions

1. Express each series in simplified sigma notation. Algebraically determine the sum of the series. If a sum does not exist, explain why.

a.  $3 + 12 + 48 + \dots + 49\,152$       b.  $1 + 6 + 11 + \dots + 111$

c.  $10 + 5 + 5/2 + 5/4 + \dots$       d.  $1/4 + 1/2 + 1 + \dots$

e.  $10 + 7 + 4 + 1 + \dots$

2. Write the first four terms of each series. Algebraically determine the sum of each series.

a.  $\sum_{n=2}^8 3\left(\frac{5}{3}\right)^{n-1}$       b.  $\sum_{j=1}^{15} (4j-3)$       c.  $\sum_{n=1}^{\infty} 12\left(\frac{1}{2}\right)^{n-1}$

## ANSWERS:

1. a.  $\sum_{n=1}^8 3(4)^{n-1} \quad S = 65\,535$

b.  $\sum_{n=1}^{23} (5n-4) \quad S = 1288$

c.  $\sum_{n=1}^{\infty} 10\left(\frac{1}{2}\right)^{n-1} \quad S = 20$

d.  $\sum_{n=1}^{\infty} \frac{1}{4}(2)^{n-1} \quad \text{No sum (infinite geometric series with } r > 1)$

e.  $\sum_{n=1}^{\infty} (-3n+13) \quad \text{No sum (infinite arithmetic series)}$

2. a.  $5 + \frac{25}{3} + \frac{125}{9} + \frac{625}{27} + \dots + t_7 = \frac{189\,845}{729}$

b.  $1 + 5 + 9 + 13 + \dots + t_{15} = 435$

c.  $12 + 6 + 3 + \frac{3}{2} + \dots = 24$