

Geometric Sequences and Series

Date _____ Period _____

Find the common ratio, the 8th term, the explicit formula, and the three terms in the sequence after the last one given.

1) 1, 6, 36, 216, ...

2) -2, 12, -72, 432, ...

3) -3, -12, -48, -192, ...

4) 4, -16, 64, -256, ...

5) 1, -6, 36, -216, ...

6) 4, -20, 100, -500, ...

Evaluate each geometric series described.

7) $4 + 12 + 36 + 108\dots, n = 9$

8) $-3 - 12 - 48 - 192\dots, n = 6$

9) $\sum_{k=1}^9 2 \cdot 2^{k-1}$

10) $\sum_{n=1}^9 5^{n-1}$

Determine the number of terms n in each geometric series.

11) $a_1 = -4, r = -2, S_n = -44$

12) $a_1 = -4, r = 4, S_n = -340$

13) $\sum_{m=1}^n -3 \cdot (-5)^{m-1} = -39063$

14) $\sum_{k=1}^n (-5)^{k-1} = -104$

Evaluate each infinite geometric series described.

$$15) \sum_{n=1}^{\infty} 4 \cdot \left(-\frac{1}{2}\right)^{n-1}$$

$$16) \sum_{i=1}^{\infty} -2 \cdot \left(\frac{3}{4}\right)^{i-1}$$

$$17) \sum_{k=1}^{\infty} 27 \cdot \left(\frac{1}{3}\right)^{k-1}$$

$$18) \sum_{i=1}^{\infty} 3 \cdot (-2)^{i-1}$$

Determine the common ratio of the infinite geometric series.

$$19) a_1 = -\frac{8}{5}, S = -\frac{16}{15}$$

$$20) a_1 = -3, S = -\frac{15}{4}$$

$$21) a_1 = 1, S = 1.25$$

$$22) a_1 = 5, S = \frac{15}{2}$$