

## Geometric Series

Evaluate each geometric series described.

1)  $2 - 12 + 72 - 432 \dots, n = 7$

2)  $-1 - 5 - 25 - 125 \dots, n = 9$

3)  $-1 + 4 - 16 + 64 \dots, n = 6$

4)  $-4 - 20 - 100 - 500 \dots, n = 6$

5)  $\sum_{i=1}^7 -2 \cdot (-5)^{i-1}$

6)  $\sum_{i=1}^8 2^{i-1}$

7)  $\sum_{k=1}^9 3^{k-1}$

8)  $\sum_{m=1}^8 3 \cdot 2^{m-1}$

9)  $\sum_{k=1}^7 3^{k-1}$

10)  $\sum_{m=1}^{10} 4^{m-1}$

Determine the number of terms  $n$  in each geometric series.

11)  $a_1 = 4, r = -5, S_n = -10416$

12)  $a_1 = -1, r = 2, S_n = -7$

13)  $a_1 = -4, r = -6, S_n = -159964$

14)  $a_1 = 1, r = 3, S_n = 121$

Determine if each geometric series converges or diverges.

15)  $\frac{32}{81} - \frac{16}{27} + \frac{8}{9} - \frac{4}{3} \dots$

16)  $\frac{7}{6} + \frac{7}{18} + \frac{7}{54} + \frac{7}{162} \dots$

17)  $1 + 4 + 16 + 64 \dots$

18)  $4 - 8 + 16 - 32 \dots$

19)  $-6 - 3 - \frac{3}{2} - \frac{3}{4} \dots$

20)  $\frac{135}{8} + \frac{45}{4} + \frac{15}{2} + 5 \dots$

21)  $\sum_{n=1}^{\infty} -64 \cdot \left(\frac{1}{2}\right)^{n-1}$

22)  $\sum_{k=1}^{\infty} -4 \cdot \left(\frac{1}{5}\right)^{k-1}$

Evaluate each infinite geometric series described.

23)  $1 + 0.6 + 0.36 + 0.216 \dots$

24)  $-250 + 50 - 10 + 2 \dots$

25)  $1 - 2 + 4 - 8 \dots$

26)  $1 + \frac{3}{4} + \frac{9}{16} + \frac{27}{64} \dots$

27)  $\sum_{i=1}^{\infty} 0.8^{i-1}$

28)  $\sum_{n=1}^{\infty} -\frac{81}{16} \cdot \left(\frac{2}{3}\right)^{n-1}$

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

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

Determine the common ratio of the infinite geometric series.

31)  $a_1 = -4.2, S = -21$

32)  $a_1 = 4, S = 8$

33)  $a_1 = 1, S = \frac{2}{3}$

34)  $a_1 = 1, S = \frac{4}{3}$