

Sequences and Series

Name: _____

1. Determine whether each series is geometric. Justify your answers.

a) $5 + 6 + 7.2 + 8.64 + \dots$

Geometric $r=1.2$

b) $3125 - 625 + 125 - 25 + \dots$

geometric $r=-0.2$

c) $\frac{3}{4} + \frac{1}{2} + \frac{1}{3} + \frac{2}{9} + \dots$

Geometric $r=\frac{2}{3}$

d) $2 + 3 + 5 + 8 + \dots$

not geometric

2. For each geometric series, state the values of t_1 and r . Then, determine each partial sum.

a) $0.43 + 0.0043 + 0.00043 + \dots, (S_6)$

$t_1 = 0.43, r = 0.01, S_6 = \frac{43}{99}$

b) $5 - 5 + 5 - \dots, (S_{10})$

$t_1 = 5, r = -1, S_{10} = 0$

c) $-100 + 50 - 25 + \dots, (S_7)$

$t_1 = -100, r = -0.5, S_7 = -\frac{1075}{16}$

3. Determine the partial sum, S_n , for each geometric series described.

a) $t_1 = 50, r = 1.1, n = 4$

232.05

b) $t_1 = -4, r = 2, n = 10$

-4092

c) $t_n = (-5)(0.5)^{n-1}, n = 5$

$-\frac{155}{16}$

d) $t_n = (3)(2)^{n-1}, n = 12$

12285

4. Determine the partial sum, S_n , for each geometric series.

a) $2 + 6 + 18 + \dots + 354294$

531440

b) $t_1 = -3, r = -2, t_n = 6144$

4095

c) $S_n = (-32)(0.75^n - 1), n = 6$

$\frac{3367}{128}$

5. Determine the first term for each geometric series.

a) $S_n = 3932.4$, $t_n = 4915.2$, $r = -4$

1.2
b) $S_n = 292\,968$, $n = 8$, $r = 5$

3
6. Determine the number of terms in each geometric series.

a) $4 + 20 + 100 + \dots + t_n = 15\,624$

6
b) $1792 - 896 + 448 - \dots - t_n = 1197$

9
7. The fourth term of a geometric series is 30; the ninth term is 960. Determine the sum of the first nine terms.

1416.25
8. The first term of a geometric series is 3. The sum of the first two terms of the series is 15 and the sum of the first three terms of the series is 63. Determine the common ratio.

4
9. Determine the first four terms of each geometric series.

a) $S_n = 5(3^n - 1)$

$10, 30, 90, 270$
b) $S_n = -24(0.5^n - 1)$

$12, 6, 3, 1.5$

10. A ball is dropped from the top of a 25-m ladder. In each bounce, the ball reaches a vertical height that is $\frac{3}{5}$ the previous vertical height. Determine the total vertical distance travelled by the ball when it contacts the ground for the sixth time. Express your answer to the nearest tenth of a metre.

94.2m