Pre-Calculus 12

Geometric Series Worksheet

1. Find the indicated sum for each of the following geometric series.
   (a) $2 + 10 + 50 + \ldots$ (S_5)
   (b) $4 + 12 + 36 + \ldots$ (S_7)
   (c) $24 + 12 + 6 + \ldots (S_6)$
   (d) $5 - 15 + 45 - \ldots$ (S_8)

2. Find the sum of each geometric series.
   (a) $2 + 6 + 18 + \ldots + 1458$
   (b) $1 + 5 + 25 + \ldots + 3125$
   (c) $48 + 24 + 12 + \ldots + \frac{3}{8}$
   (d) $5 - 20 + 80 - \ldots + 20480$

3. What is the value of the first term for each geometric series described below?
   (a) $S_n = 33, t_n = 48, r = -2$
   (b) $Sn = 443, n = 6, r = \frac{1}{3}$

4. The sum of $6 + 18 + 54 + \ldots + t_n$ is 2184. How many terms are in the series?

5. A doctor prescribes 200mg of medication on the first day of treatment. The dosage is halved on each successive day for one week. To the nearest milligram, what is the total amount of medication administered?

6. A tennis ball dropped from a height of 50m bounces to 30% of its previous height on each bounce. What is the total vertical distance, to the nearest hundredth of a meter, the ball travels when it hits the ground for the sixth time?

7. If $3 + 3^2 + 3^3 + \ldots + 3^n = 9840$ find n.

8. The sum of the first two terms of a geometric series is 12 and the sum of the first three terms of the same series is 62. Find the first three terms of the series.

Answers:

1. (a) 1562 (b) 4372 (c) $\frac{189}{4}$ (d) -8200
2. (a) 2186 (b) 3906 (c) $\frac{765}{8}$ (d) 16385
3. (a) 3 (b) $\frac{107649}{364}$
4. 6
5. 397mg
6. 92.75m
7. 8
8. 2, 10, 50 or 72, -60, 50