

## Sequences and Series Test 60

1) Answer the questions given the geometric sequence;

6, 18, 54, ....

- a) The first term  $a =$  \_\_\_\_\_ .
- b) The common ratio  $r =$  \_\_\_\_\_ .
- c) The next three terms are; \_\_\_\_\_ , \_\_\_\_\_ , \_\_\_\_\_ .
- d) The tenth term  $t_{10} =$  \_\_\_\_\_.

2) A population of bacteria triples (x3) every hour. The initial population is 70.

- a) Find the population at the end of six hours. \_\_\_\_\_.
- b) When will the population be 12,400,290? \_\_\_\_\_.

3) The first term of a geometric series is  $a = 5$ . The common ratio  $r =$   
4. Answer the following questions.

- a) Find the fifth term  $t_5$ . \_\_\_\_\_.
- b) Find the number of the term  $n$ , which equals 81,920. \_\_\_\_\_.
- c) Find the sum of the first twelve terms. \_\_\_\_\_.

4) Suppose that someone gives you 1 cent on day 1, 2 cents on day 2, 4 cents on day 3, 8 cents on day 4, and so on. The amount increases geometrically. How much money (in dollars) will you have at the end of day 15?

5) Write the following series in expanded form and find the sum.

$$\sum_{i=1}^5 \frac{1}{4} \cdot [2]^{i-1} =$$

6) Consider the series; 81 -27 +9 ....

a) Write down the next three terms. \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_.

b) Which term is equal to -1/243? \_\_\_\_\_.

c) Find the sum of the first 10 terms. (express as a fraction or write as a decimal number to three decimal places) \_\_\_\_\_.

d) Find the sum of the infinite series. \_\_\_\_\_.

7) Find a geometric mean between the numbers.

a) 4, \_\_\_\_\_, 36,                      b) 32, \_\_\_\_\_, 4.

8) For a geometric sequence,  $t_3 = -12$  and  $t_6 = 96$ .

a) The first term  $a =$  \_\_\_\_\_ .,                      b) The common ratio  $r =$  \_\_\_\_\_ .

9) Express the number, 0.0777... as a fraction.

10) An oil well pumps 16,000 barrels of oil in its first month. It is found that in each subsequent month, the well pumps 5% less oil than in the previous month. Estimate the total amount of oil pumped over the lifetime of the well. (hint: find the sum of an infinite series)

11) A ball is dropped from a height of 180 cm. It bounces up to 25% of the previous height. Estimate the total distance traveled by the ball.

Answers: 1)a) 6, b) 3, c) 162, 486, 1458, d) 118,098, 2)a) 51,030, b) 11 hr, 3)a) 1280, b) 8, c) 27,962,025, visit [www.mrowen.com](http://www.mrowen.com), 4) \$327.67, 5)  $1/4 + 1/2 + 1 + 2 + 4 = 7.75$ , 6)a) -3, 1, -1/3, b) 10, c) 60  $182/243 = 60.749$ , d)  $243/4$ , 7)a)  $\pm 12$ , b)  $\pm 8\sqrt{2}$ , 8)a) -3, b) -2, 9)  $7/90$ , 10) 320,000 barrels, 11) 300 cm.