

## Sequences and Series Review

1) Determine which of the following sequences are arithmetic. If the sequence is arithmetic, determine the common difference and the next 4 terms.

a) 8, 11, 14, ...

b) 2, 6, 18, ...

c) 8, 4, 2, ....

d) -2.5, -1.1, 0.3, ...

e) 20, 16, 12, ...

f) 1, 1, 2, 3, 5, ...

2) Given the arithmetic sequence 10, 7, 4, ...

a) determine the 21<sup>st</sup> term.

b) which term is -77?

3) Find the missing terms in each arithmetic sequence.

a) \_\_\_\_\_, 10, 16, \_\_\_\_\_, \_\_\_\_\_

b) \_\_\_\_\_, 9, \_\_\_\_\_, \_\_\_\_\_, -3

c) 5, \_\_\_\_\_, \_\_\_\_\_, 44

d) -3, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, 12

e) 3.4, \_\_\_\_\_, \_\_\_\_\_, -2, \_\_\_\_\_

f) 1.5, \_\_\_\_\_, \_\_\_\_\_, 0, \_\_\_\_\_

4) An arithmetic sequence has a 10th term of 18 and a 14th term of 30. Find the common difference and the first term.

5) Find the sum of the following arithmetic series.

a) 5, 9, 13, ..., 101

b) 83, 80, 77, ..., 5

6) Find the sum of the following arithmetic series.

a) The first 16 terms of 4, 11, 18 ...

b) The first 10 terms of 19, 13, 7, ...

7) Find the sum of the first 100 odd numbers.

8) Jerry deposited \$20,000 on an investment that will give \$1,750 for every year that his money stays in the account. How much money will he have in his account by the end of year 8?

9) How many terms are in the arithmetic series  $3 + \dots + 59$  if the sum is 465?

10) In his piggy bank, Bingo dropped \$1.00 on May 1, \$1.75 on May 2, \$2.50 on May 3 and so on until the last day of May.

- a) How much did he drop in his piggy bank on May 19?
- b) What was his total deposit in his piggy bank for the month of May?

11) The sum of the first 7 terms of an arithmetic series is 63. The sum of the first 8 terms is 92. The common difference is 5. Determine the first 3 terms.

12) Determine the indicated term of each geometric sequence.

- a) 1, 2, 4, ...,  $t_{14}$
- b) 6, 1.2, 0.24, ...,  $t_7$

13a) What is the general term of  $\frac{16}{9}, -\frac{4}{3}, 1, \dots$

b) How many terms are there if the last term is  $-\frac{3888}{9216}$ ?

14) Insert two numbers between 26 and 702 so that the four numbers will form a geometric sequence.

15) A culture initially has 5000 bacteria and the number increases by 8% every hour.

- a) How many bacteria are present at the end of 5 hours?
- b) Determine a formula for the number of bacteria present after n hours.

**Answers:**

- 1a)  $d=3$ ; 17, 20, 23, 26    d)  $d=1.4$ ; 1.7, 3.1, 4.5, 5.9    e)  $d=-4$ ; 8, 4, 0, -4    2a) -50,    b)  $t_{30}$   
3a) 4, 10, 16, 22, 28    b) 13, 9, 5, 1, -3    c) 5, 18, 31, 44    d) -3, 0.75, 4.5, 8.25, 12  
e) 3.4, 1.6, -0.2, -2, -3.8    f) 1.5, 1, 0.5, 0, -0.5    4)  $d=3$ ;  $a=-9$     5a) 1325    b) 1188    6a) 904    b) -80  
7) 10 000    8) \$34 000    9) 15    10a) \$14.50    b) \$379.75    11) -6, -1, 4    12a) 8192    b) 0.000384

13a)  $t_n = \frac{16}{9} \left( -\frac{3}{4} \right)^{n-1}$     b)  $t_6$     14) 78, 234    15a) about 7347 bacteria    b)  $t_n = 5000(1.08)^n$