

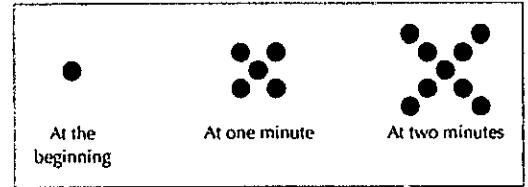
Name \_\_\_\_\_  
Algebra 1 CC

Date \_\_\_\_\_  
Period \_\_\_\_\_

### Applications of Sequences

1)

a) Describe the pattern that you see in the sequence of figures.



b) Assuming the sequence continues in the same way, how many dots are there at 3 minutes?

c) How many dots are there in  $t$  minutes?

d) How many dots are there at 100 minutes?

2) Decide if each of the following scenarios describes an arithmetic or geometric sequence. Then, write the formula for the sequence.

a) A student comes to school with the flu and infects three other students within an hour before going home. Each newly infected student passes the virus to three new students in the next hour. This pattern continues until all students in the school are infected with the virus.

Type: \_\_\_\_\_

Formula: \_\_\_\_\_

b) Round 1 of a tennis tournament starts with 128 players. After each round, half the players have lost and are eliminated from the tournament. Therefore, in round 2 there are 64 players, in round 3 there are 32 players and so on.

Type: \_\_\_\_\_

Formula: \_\_\_\_\_

c) Paul has \$680 in a savings account. He makes a deposit after he receives each paycheck. After one month he has \$758 in the account. The next month the balance is \$836. The balance after the third month is \$914.

Type: \_\_\_\_\_

Formula: \_\_\_\_\_

d) The table shows the number of country club members for four years after it began.

<b>Time (years)</b>	0	1	2	3	4
<b>Members</b>	100	200	300	400	500

Type: \_\_\_\_\_

Formula: \_\_\_\_\_

3) You won the lottery!!! You will receive \$.01 on day 1, \$.03 on day 2, \$.09 on day 3, \$.27 on day 4. This trend will continue for 16 consecutive days.

a) Write an equation that represents the amount of money that you have won, in terms of days.

b) Would you rather be given \$100,000 today or accept the lottery money after 16 days?

4) Joey has a \$100 balance on his school cafeteria account. He buys a hot lunch each day of school. After day 1, he has \$97.25 left in his account. After the second day he has \$94.50 on the account.

a) Write an equation regarding his account balance if he continues to buy the same lunch each day.

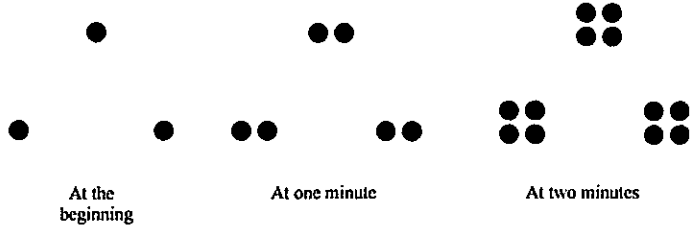
b) How many school days can he continue to buy the same lunch, while only using the money that is on his account?

5) The eleventh term of the sequence 3, -6, 12, -24, ..., is

6) What is a common ratio of the geometric sequence whose first term is 5 and third term is 125?

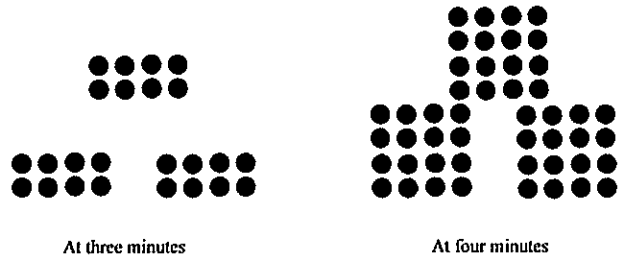
7)

a) Describe the pattern you see in the sequence of figures.



b) Assuming the sequence continues in the same way, how many dots are there at 5 minutes?

c) Write an explicit formula to describe how many dots there will be after  $t$  minutes.



8) Determine the common difference of the arithmetic sequence in which  $a_1 = 3$  and  $a_4 = 15$ .

9) A taxi ride costs \$3.00 for the first mile, and \$1.25 each additional mile.

a) Write an equation representing the cost in terms of miles.

b) How much would 20 miles cost?

10)

Consider the sequence below. If we represent this sequence with the letter  $a$  then do the following.

1, 7, 13, 19, 25, 31, 37, 43

(a) Find  $a(5)$

(b) Find  $a_2 + a_6$

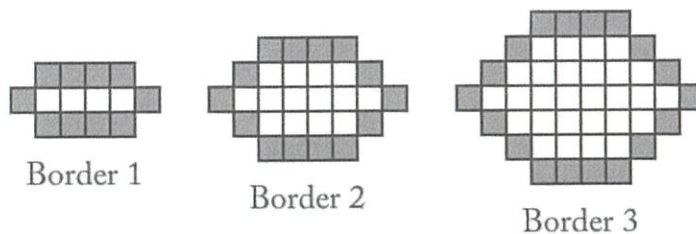
(c) Find  $a(4) + 2a(6)$

(d) Find  $\sqrt{a(5)}$

(e) Find  $\frac{a(5) - a(3)}{2}$

11) Given: the sequence 4, 7, 10, 13,... When using the arithmetic sequence formula  $a_n = (n - 1)d + a_1$  to determine the 10th term, which variable would be replaced with the number 3?

12) Fred decides to cover the kitchen floor with tiles of different colors. He starts with a row of four tiles of the same color. He surrounds these four tiles with a border of tiles of a different color (Border1). The design continues as shown below:



Type: \_\_\_\_\_ Formula: \_\_\_\_\_