

**Do Now**

1) Write an explicit formula for this sequence: {4, 14, 24, 34,.....}

$$a_1 = 4 \quad a_n = 4 + 10(n-1)$$

$$d = 10 \quad a_n = 4 + 10n - 10$$

2) Then find  $a_{14}$   $a_n = 10n - 6$

$$a_{14} = 10(14) - 6$$

$$a_{14} = 140 - 6$$

$$a_{14} = 134$$

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**Homework Answers**

1)  $A_n = -15(3)^{n-1}$

$A_9 = -98415$

2)  $A_n = 96\left(\frac{1}{2}\right)^{n-1}$

$A_8 = \frac{3}{4}$

3) a.  $A_n = 10n - 6$

b.  $A_6 = 54$

4) a.  $A_n = 2n + 3$

b.  $A_{11} = 25$

5)  $A_n = 2(-4)^{n-1}$

$A_8 = -362768$

6)a.  $A_1 = 4$

b.  $A_n = 4(-2)^{n-1}$

7) a.  $A_1 = 4$

b.  $A_n = 4(3)^{n-1}$

8)  $A_n = -10n + 29$

$A_{20} = -171$

9)  $A_n = 4n - 1$

$A_{37} = 147$

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## Sequence Word Problems

Procedure to solve word problems with sequences:

- 1) Identify if it is arithmetic or geometric
- 2) Find the first value to be used in the sequence  
 - (it may be helpful to create a table!)  $a_1, a_2, a_3, \dots$
- 3) Find the common difference/ratio
- 4) Use the appropriate formula
- 5) Determine which "n" value you are looking for and calculate to find it (be careful of time units)

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- 1) There is a stack of logs in the backyard. There are 15 logs in the 1st layer, 14 logs in the 2nd layer, 13 logs in the 3rd layer and so on with the last layer having one log. How many logs are in the 10th layer?

15, 14, 13, ... Arithmetic  
 $a_1, a_2, a_3$        $A_n = a_1 + (n-1)d$

$$A_n = 15 + (n-1)(-1) \quad a_1 = 15$$

$$d = -1$$

$$A_{10} = 15 + (10-1)(-1)$$

$$A_{10} = 15 + (9)(-1)$$

$$A_{10} = 15 - 9$$

$$A_{10} = 6$$

10<sup>th</sup> layer  
has 6 logs

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6) Suppose you drop a tennis ball from a height of 15 feet. After the ball hits the floor, it rebounds to 85% of its previous height. How high will the ball rebound after its third bounce? Round to the nearest tenth.

$$A_0 = 15 \text{ feet}$$

$$A_1 = .85(15)$$

$$A_1 = 12.75$$

$$r = .85$$

Geometric  $A_n = a_1 r^{n-1}$

$$A_n = 12.75 (.85)^{n-1}$$

$$A_3 = 12.75 (.85)^{3-1}$$

$$A_3 = 9.211875$$

$$A_3 = \boxed{9.2 \text{ feet}}$$

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3) Your grandmother gives you \$1000 to start a college book fund. She tells you she will add \$200 to the fund each month, if you will add \$5 each month. After how many months will the college book fund have \$5715?

$$A_0 = 1000$$

$$A_1 = 1205$$

$$d = 205 \quad A_n = a_1 + (n-1)d$$

$$A_n = 1205 + (n-1)(205)$$

$$5715 = 1205 + 205(n-1)$$

$$5715 = 1205 + 205n - 205$$

$$5715 = 1000 + 205n$$

$$4715 = 205n$$

$$\frac{4715}{205} = \frac{205n}{205}$$

$$23 = n$$

23 months

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