

Name: Key

**Math 1 Spring 2017  
Final Review**  
All assignments are due the day after they are assigned

HW#	In Class	Assignment Details
42 4/3 M	Review Module 1-2	Review Packet
43 4/4 T	Review Module 3-4	Review Packet
44 4/5 W	<b>Final</b>	☺
45 4/6 Th	Review Final	☺ Happy Spring Break! ☺

**MODULE 1:**

Solve the following equations for the unknown variable.

1.  $3(2x + 1) = 2(x + 3) + 3x$   
 $6x + 3 = 2x + 6 + 3x$   
 $6x + 3 = 5x + 6$   
 $x = 3$

2.  $3 \cdot \frac{-2(p-8)}{2} = 12 \cdot 3$   
 $-2(p-8) = 36$   
 $-2p + 16 = 36$   
 $-2p = 20$   
 $p = -10$

3. Write an equation that represents the scenario below.

- Some students are sitting at the front table. (I got distracted by an incident in the back of the lunchroom, and forgot to record how many students.)  $x$
- Each of the students at the front table has been joined by a friend, doubling the number of students at the table.  $2x$
- Four more students have just taken seats with the students at the front table.  $2x + 4$
- The students at the front table separated into three equal-sized groups and then two groups left, leaving only one-third of the students at the table.  $\frac{2x+4}{3}$
- As the lunch period ends, there are still 12 students seated at the front table.

$$\frac{2x+4}{3} = 12$$

4. Write a scenario that matches the equation below.

$$\frac{2(x+4)}{3} = 12$$

A group of students are sitting at a table for lunch, I don't remember how many. Four friends joined them, and then each student invited a friend to sit at the table. Once the bell rings, only a third of the student stay at the table. That is when I saw there were 12 students left.

5. Solve the following equation for x.

a.  $3x + 5y = 20$

$$\underline{-5y} \quad \underline{-5y}$$

$$\frac{3x}{3} = \frac{20 - 5y}{3}$$

$$x = \frac{20 - 5y}{3}$$

b.  $7x - 3y = 21$

$$\underline{+3y} \quad \underline{+3y}$$

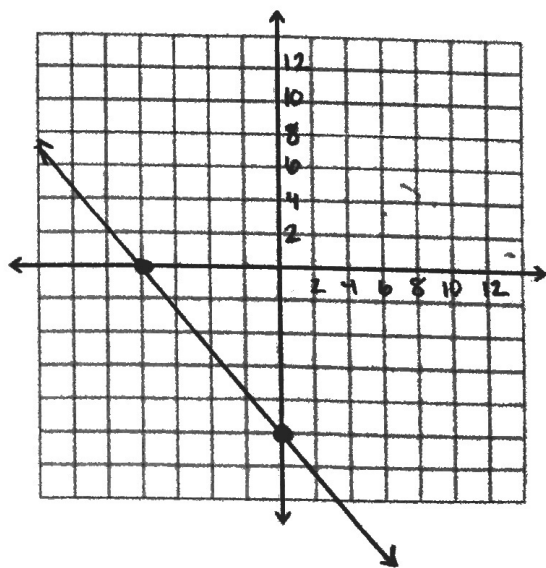
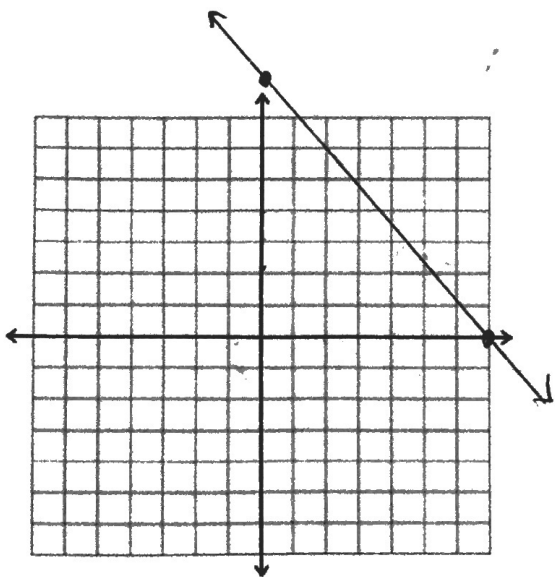
$$\frac{7x}{7} = \frac{21 + 3y}{7}$$

$$x = \frac{21 + 3y}{7}$$

Write the equation of the line in slope intercept form. Then graph each line.

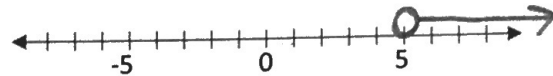
6.  $8x + 7y = 56$

7.  $-5x - 4y = 40$



#8-11. Solve each inequality. Graph the solutions on the number line AND state 3 numbers in the solution set. Show all your work!

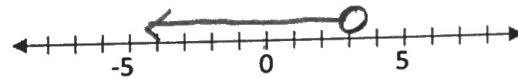
8.  $2x + 7 > 17$   
 $2x > 10$   
 $x > 5$



3 numbers in the solution set:  
 6, 7, 8

9.  $20 > 6z + 2$   
 $-6z \quad -6z$

$-6z + 20 > 2$ , *sign flip!*  
 $\frac{-6z}{-6} > \frac{-18}{-6} \rightarrow z < 3$



3 numbers in the solution set:  
 0, 1, 2

11.  $7y - 1 \leq 29 + 2y$   
 $5y \leq 30$   
 $y \leq 6$

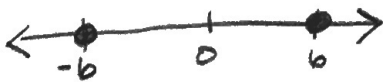


3 numbers in the solution set:  
 4, 5, 6

Solve. Then graph the solution.

12.  $|x| = 6$

$x = 6$     $x = -6$



14.  $|x + 3| = 42$

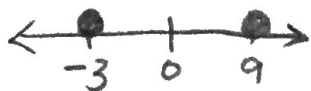
$x + 3 = 42$     $x + 3 = -42$   
 $x = 39$     $x = -45$



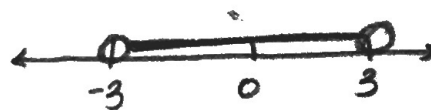
16.  $\frac{1}{2}|x - 3| - 2 = 1$

$\frac{1}{2}|x - 3| = 3$   
 $|x - 3| = 6$

$x - 3 = 6$     $x - 3 = -6$   
 $x = 9$     $x = -3$

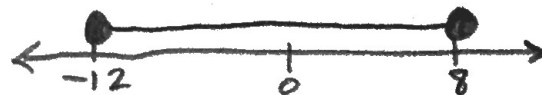


13.  $|x| < 3$



15.  $|x + 2| \leq 10$

$x + 2 = 10$     $x + 2 = -10$   
 $x = 8$     $x = -12$



17.  $|x + 1| - 3 > 6$

$|x + 1| > 9$

$x + 1 = 9$     $x + 1 = -9$   
 $x = 8$     $x = -10$

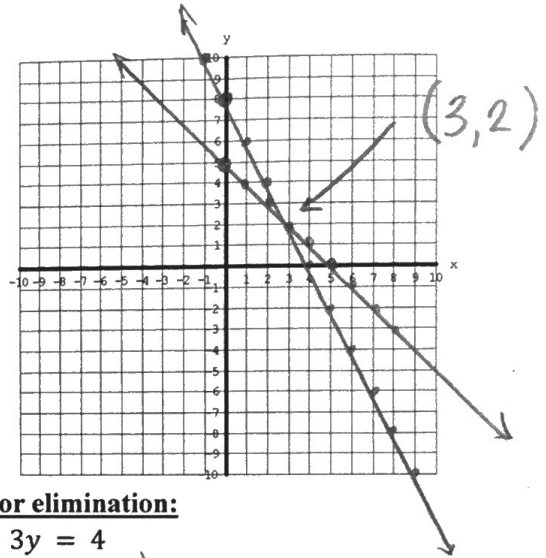


## MODULE 2:

For #18 solve each system of equation by graphing:

18.  $y + x = 5$   
 $y = -2x + 8$

$(3, 2)$



Check:

$2 + 3 = 5 \checkmark$

$2 = -2(3) + 8$

$2 = -6 + 8 \checkmark$

For #13-14, solve each system of equations using the substitution or elimination:

19.  $y = -x + 15$   
 $4x + 3y = 38$

$4x + 3(-x + 15) = 38$

$4x - 3x + 45 = 38$

$x + 45 = 38$

$x = -7$

$y = -(-7) + 15$

$y = 22$

$(-7, 22)$

20.  $2x - 3y = 4$

$-2(x + 4y = -9)$

$-2x - 8y = 18$

$-11y = 22$

$y = -2$

$x + 4(-2) = -9$

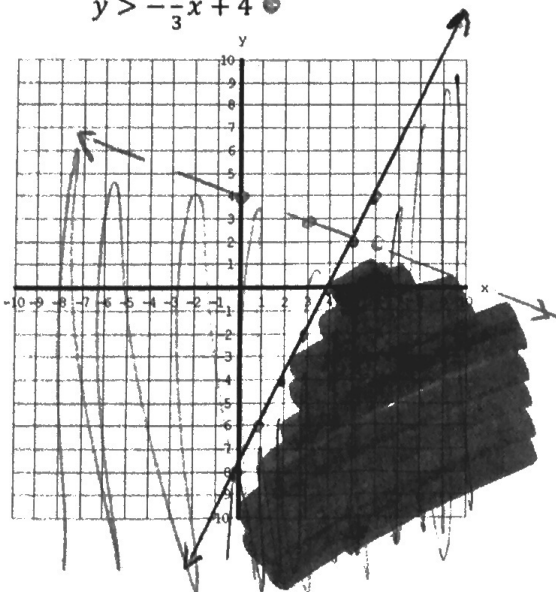
$x - 8 = -9$

$x = -1$

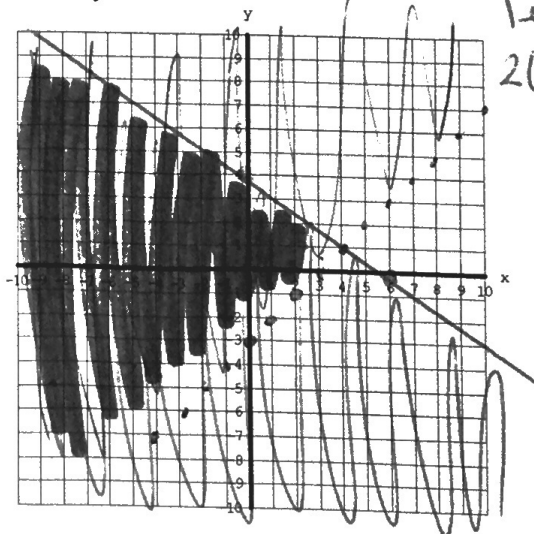
$(-1, -2)$

For #21-22, solve each system of inequalities.

21.  $y \leq 2x - 8$   
 $y > -\frac{1}{3}x + 4$



22.  $2x + 3y \leq 12$   
 $y > x - 3$



Test:  $(0, 0)$   
 $2(0) + 3(0) \leq 12$   
 $0 \leq 12 \checkmark$

23. Jason is buying wings and hot dogs for a party. One package of wings costs \$7. Hot dogs cost \$4 per pound. He must

spend less than \$40.

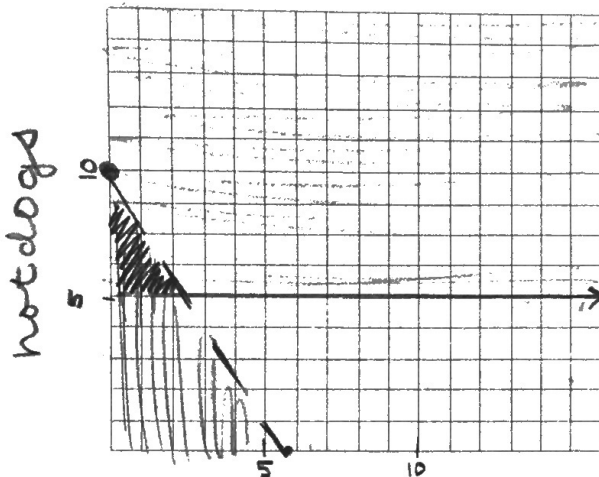
a. Write an inequality to represent the cost of Jason's food for the party.

$$7w + 4h < 40$$

b. Jason knows that he will be buying at least 5 pounds of hot dogs. Write an inequality to represent this situation.

$$h \geq 5$$

c. Graph both inequalities and shade the intersection.



d. Identify two solutions and justify your answers.

$(1, 6)$   $(0, 7)$

$$7(1) + 4(6) < 40$$

$$7 + 24 < 40$$

$$31 < 40 \checkmark$$

$$6 \geq 5 \checkmark$$

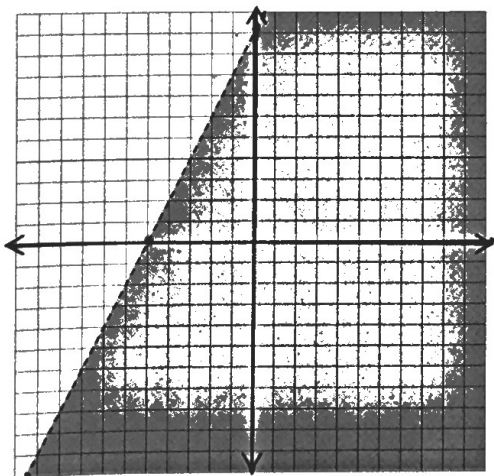
$$7(0) + 4(7) < 40$$

$$28 < 40 \checkmark$$

$$7 \geq 5 \checkmark$$

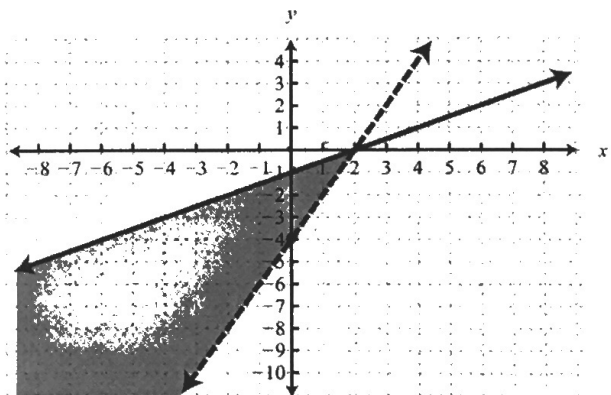
Given the graph with the regions that are shaded, write the inequality.

24.



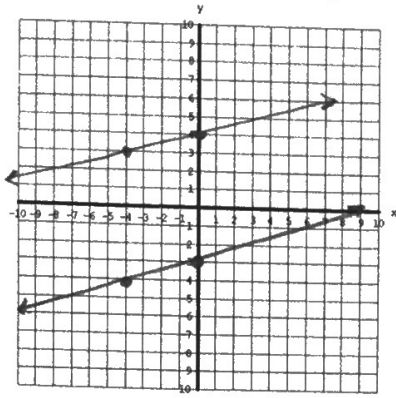
$$y < 2x + 10$$

25.



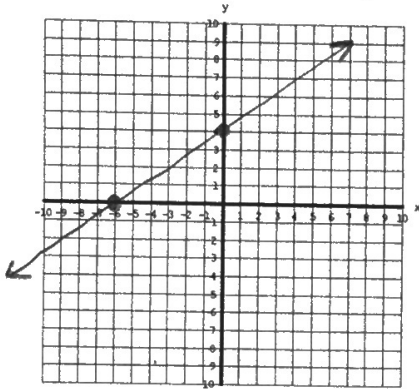
$$\begin{cases} y \leq \frac{1}{2}x - 1 \\ y > 2x - 4 \end{cases}$$

26. Draw an example of two lines in the plane that will have no solution. Write the equation for both lines.



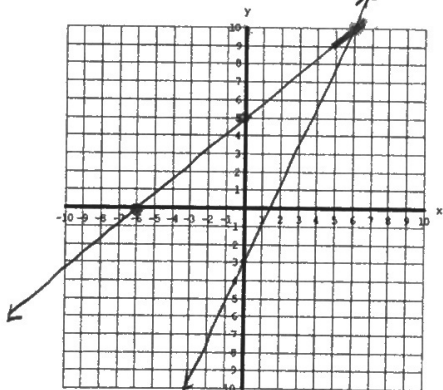
$$\begin{cases} y = \frac{1}{4}x + 4 \\ y = \frac{1}{4}x - 3 \end{cases}$$

27. Draw an example of two lines in the plane that will have infinitely many solutions. Write the equation for both lines.



$$\begin{cases} y = \frac{2}{3}x + 4 \\ y = \frac{2}{3}x + 4 \end{cases}$$

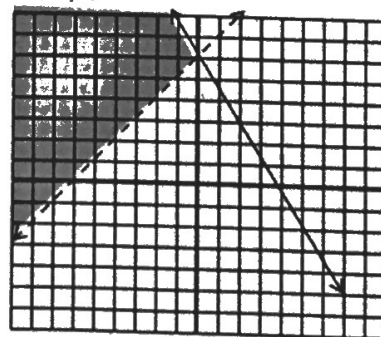
28. Draw an example of two lines in the plane that will have one solution. Write the equation for both lines.



$$\begin{cases} y = \frac{5}{6}x + 5 \\ y = \frac{13}{6}x - 3 \end{cases}$$

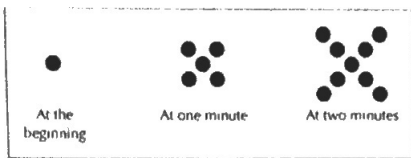
29. Are the following points solutions to the graph?

- a. (0,0) ✗
- b. (-6,0) ✗
- c. (-8,0) ✓
- d. (0,6) ✗
- e. (2,3) ✗



MODULE 3:

30.

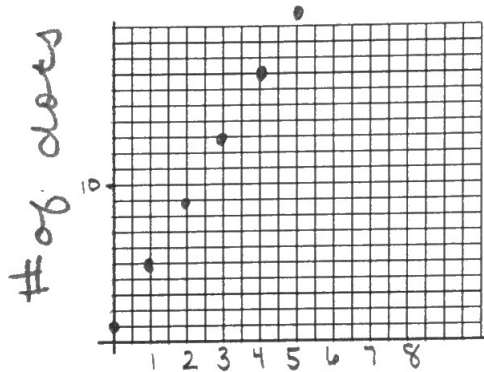


Write an explicit and recursive function.

R:  $f(0) = 1, f(n) = f(n-1) + 4$

E:  $f(n) = 4n + 1$

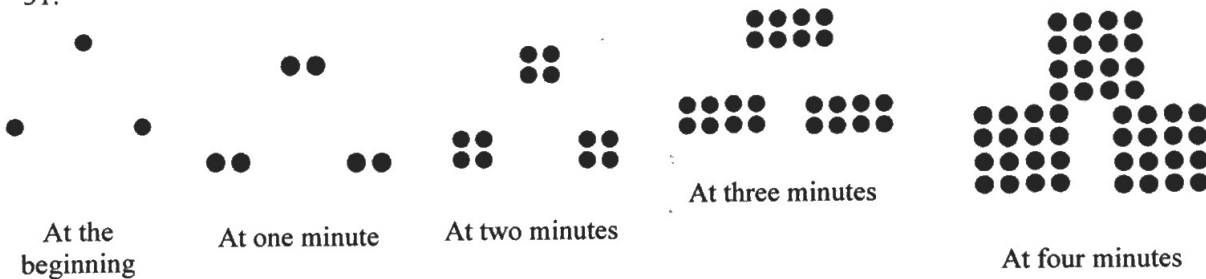
Day	Number of Dots
0	1
1	5
2	9
3	13



How many dots are there at 100 minutes?

$f(100) = 4(100) + 1 = 401 \text{ dots}$  Day

31.

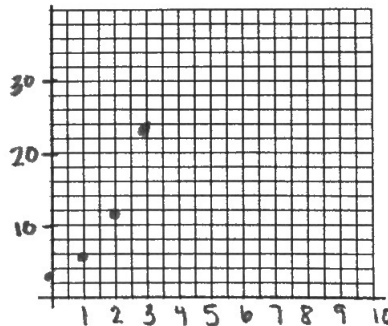


Write an explicit and recursive function.

R:  $f(0) = 3, f(n) = f(n-1) \times 2$

E:  $f(n) = 3 \cdot 2^n$

Day	Number of Dots
0	3
1	6
2	12
3	24



How many dots are there at <sup>25</sup>100 minutes?

$f(25) = 3 \cdot 2^{25} = 100,663,296$

31. Mr. and Mrs. Gloop want their son, Augustus, to do his homework every day. Augustus loves to eat candy, so his parents have decided to motivate him to do his homework by giving him candies for each day that the homework is complete. Mr. Gloop says that on the first day that Augustus turns in his homework, he will give him 10 candies. On the second day he promises to give 20 candies, on the third day he will give 30 candies, and so on.

Recursive Formula:  $f(0) = 0, f(n) = f(n-1) + 10$  Explicit Formula:  $f(n) = 10n$

Use a formula to find how many candies Augustus will have on day 30 in this plan.

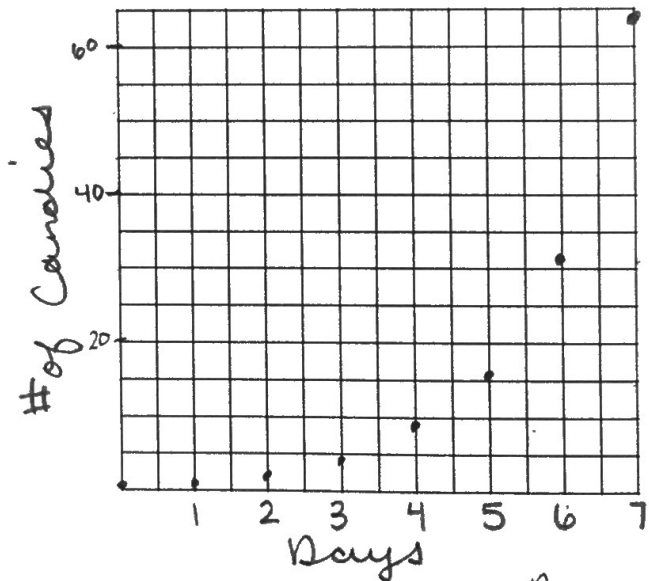
$$f(30) = 10 \cdot 30$$

$$= 300 \text{ candies}$$

32. Augustus looks in the mirror and decides that he is gaining weight. He is afraid that all that candy will just make it worse, so he tells his parents that it would be ok if they just give him 1 candy on the first day, 2 on the second day, continuing to double the amount each day as he completes his homework. Mr. and Mrs. Gloop likes Augustus' plan and agrees to it.

Model the amount of candy that Augustus would get each day he reaches his goals with the new plan.

# of Days	# of Candies
1	1
2	2
3	4
4	8
5	16
6	32
7	64



Recursive Formula:  $f(1) = 1, f(n) = f(n-1) \times 2$  Explicit Formula:  $f(n) = \frac{1}{2} \cdot 2^n$

or

$$f(n) = 2^{n-1}$$

Use a formula to find how many candies Augustus will have on day 30 in this plan.

$$f(30) = \frac{1}{2} \cdot 2^{30}$$

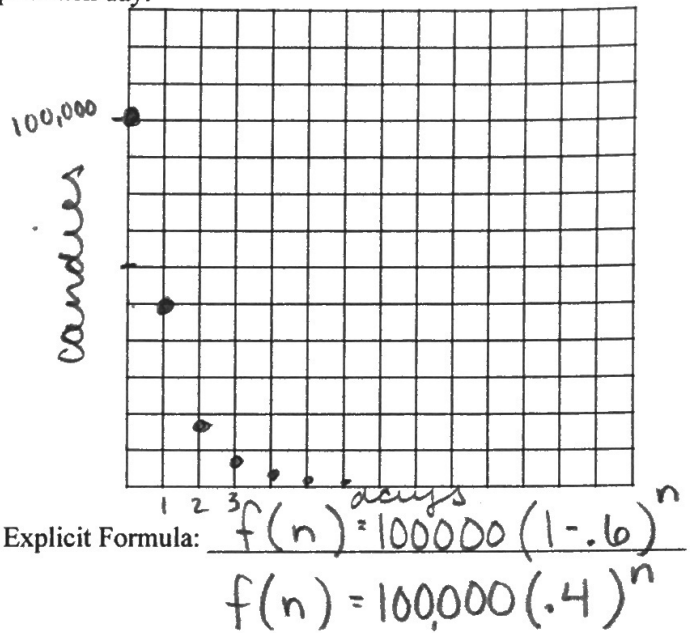
$$= 536870912 \text{ candies}$$



33. Augustus is generally selfish and somewhat unpopular at school. He decides that he could improve his image by sharing his candy with everyone at school. When he has a pile of 100,000 candies, he generously plans to give away 60% of the candies that are in the pile each day. Although Augustus may be earning more candies for doing his homework, he is only giving away candies from the pile that started with 100,000. (He's not that generous.)

Model the amount of candy that would be left in the pile each day.

# of Days	# of Candies
0	100,000
1	40,000
2	16,000
3	6,400
4	2,560
5	1,024
6	409.6



Recursive Formula:  $f(0) = 100,000$   
 $f(n) = f(n-1) \times .4$

Explicit Formula:  $f(n) = 100,000 (1-.6)^n$   
 $f(n) = 100,000 (.4)^n$

34.

Fill in the table below for each arithmetic sequence.

x	1	2	3	4	5	6	7
y	-5	-2	1	4	7	10	13

$$\frac{13 - (-5)}{6} = \frac{18}{6} = 3$$

x	1	2	3	4	5	6	7
y	2	3.23	4.46	5.69	6.92	8.15	9.38

$$\frac{9.38 - 2}{6} = 1.23$$

Fill in the table below for each geometric sequence.

x	1	2	3	4	5	6	7
y	2	10	50	250	1250	6250	31,250

$$\frac{31250}{2} = 15625$$

$$\sqrt[5]{15625} = 5$$

x	0	1	2	3	4
y	-6250	-1250	-250	-50	-10

$$\frac{-10}{-6250} = .0016$$

$$\sqrt[4]{.0016} = .2$$

**MODULE 4:**

35. Match the type of interest on the left with the equation used to calculate that interest on the right.

B Amount of simple interest owed

a.  $A = P(1 + r)^t$

C Total amount owed to lender after  $t$  years of simple interest

b.  $i = Prt$

D Value after  $t$  years of depreciation

c.  $A = P + P \times t \times r$

A Total amount owed to lender after  $t$  years of compound interest

d.  $A = P(1 - r)^t$

36. Write the equation of the line that has a slope of -2 and goes through (-1, -3) in point slope form.

$$y = -2(x + 1) - 3$$

37. Write the equation of the line that goes through (-5, 11) and (5, -19) in point slope form.

$$m = \frac{-19 - 11}{5 - (-5)} = \frac{-30}{10} = -3 \quad y = -3(x + 5) + 11$$

38. Carly is at a car dealership and is trying to decide on which car would be best to buy. Car 1 costs \$36,000 but will depreciate 12% each year. Car 2 costs \$30,000, but will depreciate 8% each year. The sneaky salesman tells Carly she should buy Car 1 because even though it costs more now, it will always be worth more than Car 2. Give Carly your very specific advice about which car to buy considering Carly doesn't know how long she will keep the car. Back up your advice with specific facts.

Car 1

$$A = 36,000(1 - .12)^t$$

$$A = 36,000(.88)^t$$

Car 2

$$A = 30,000(1 - .08)^t$$

$$A = 30,000(.92)^t$$

t	A
0	36,000
1	31,680
2	27,878.4
3	24,532.99
4	21,589.03
5	18,998.35
6	16,718.55

If Carly keeps the car longer than 4 years she should buy car 2. If she keeps it less than 4 years she should get car 1.

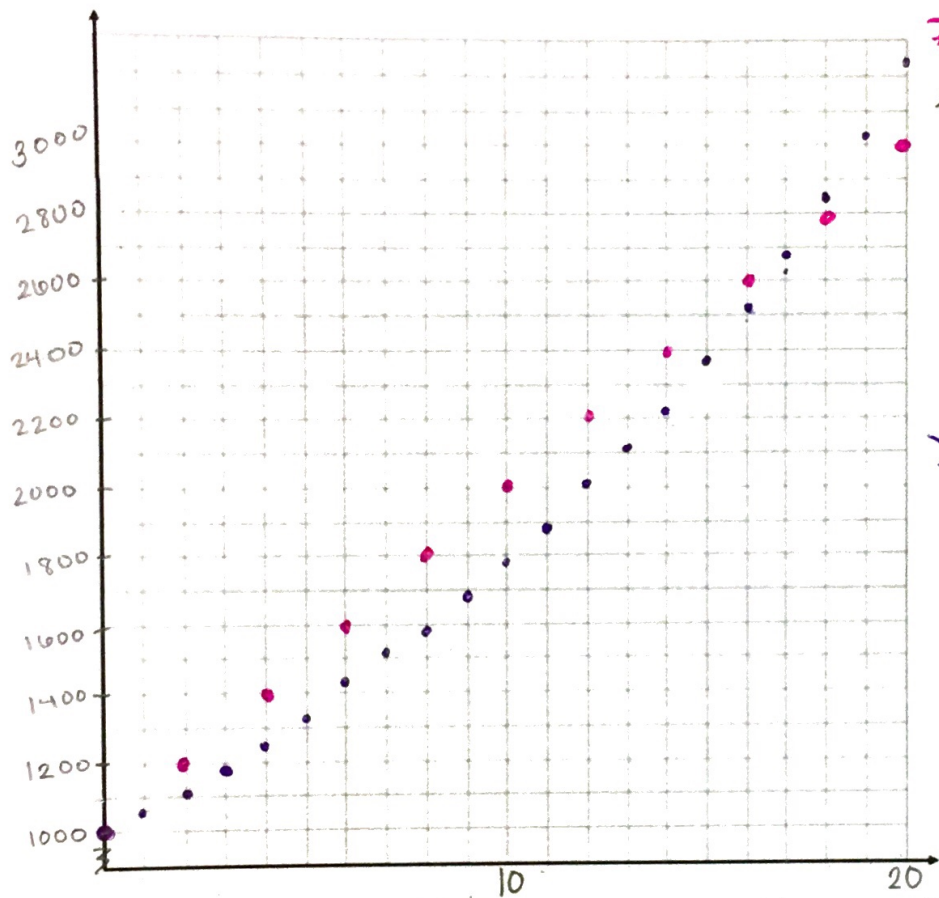
t	A
0	30,000
1	27,600
2	25,392
3	23,360.64
4	21,491.788
5	19,772.45

39. You have saved \$1,000, and need to figure out which bank you want to invest your money with. You can choose between the following two banks.

**TCF Bank**  
\$100 end of each year

**Wells Fargo Bank**  
Account earns 6% annual interest

In order to inform your decision, create explicit functions for both banks, and then graph each equation.



\* TCF Explicit:

$$f(x) = 1000 + 100x$$

x	y
10	2000
11	2100
12	2200
13	2300
14	2400

\* Wells Fargo Bank Explicit:

$$f(x) = 1000(1.06)^x$$

x	y
10	1790
11	1898
12	2012
13	2132
14	2260
15	2396
16	2540
17	2692
18	2854

Which plan is better and when? years

Plan TCF is better until your money is in the bank for 18 yrs. Then the Wells Fargo plan is better.