

Unit 4 Practice Test

Name Key  
Date \_\_\_\_\_ Period \_\_\_\_\_

1. a) Draw figure 0 and figure 4

figure 0



figure 1



figure 2

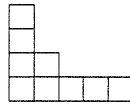


Figure 3

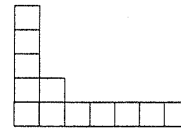
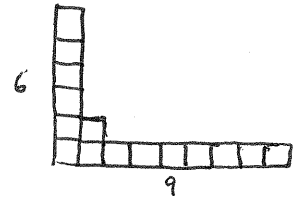


figure 4



b) Complete the table based on the above pattern.

x	0	1	2	3	4	5
y	3	6	9	12	15	18

c) Write an equation for the pattern:  $y = 3x + 3$

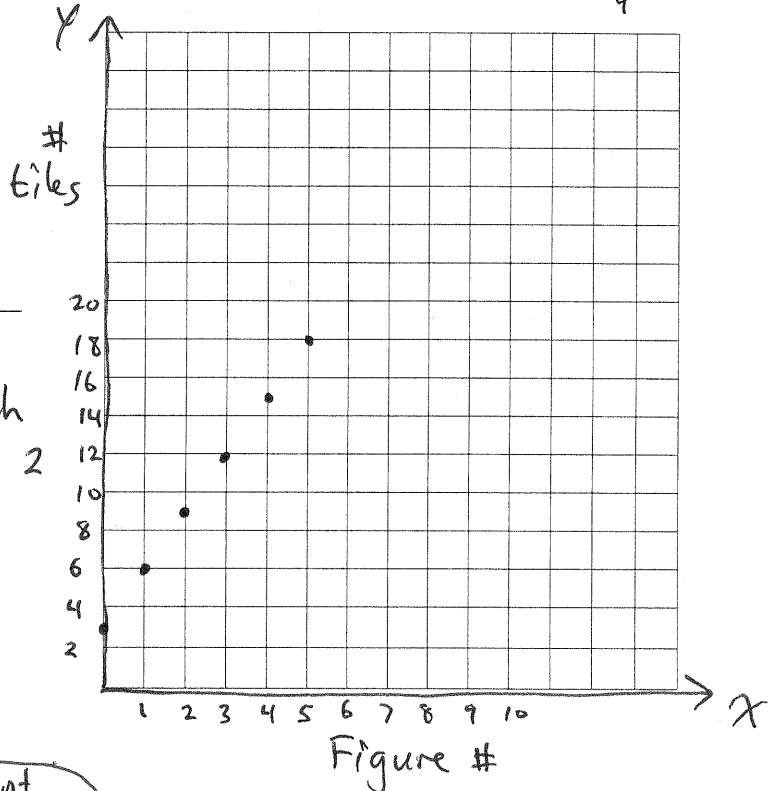
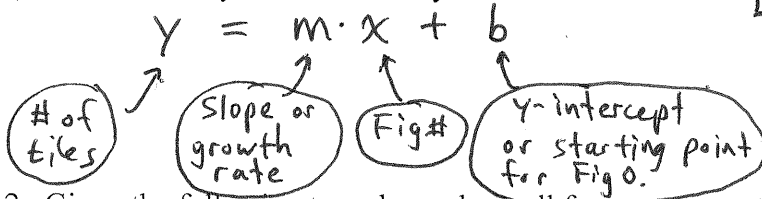
d) Describe the pattern in words:

The figure grows by 3 tiles; each new figure add 1 tile vertically and 2 tiles horizontally.

e) Graph the equation.

- Done ✓
- Scale axes
  - label axes
  - discrete graph

f) Tell me what you know about  $y = mx + b$ .



2. Given the following two clues, show all four representations (tile pattern, table, rule, graph) of the pattern.

x	y
0	16
1	13
2	10
3	7
4	4
5	1



Figure #4

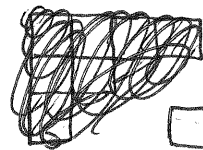
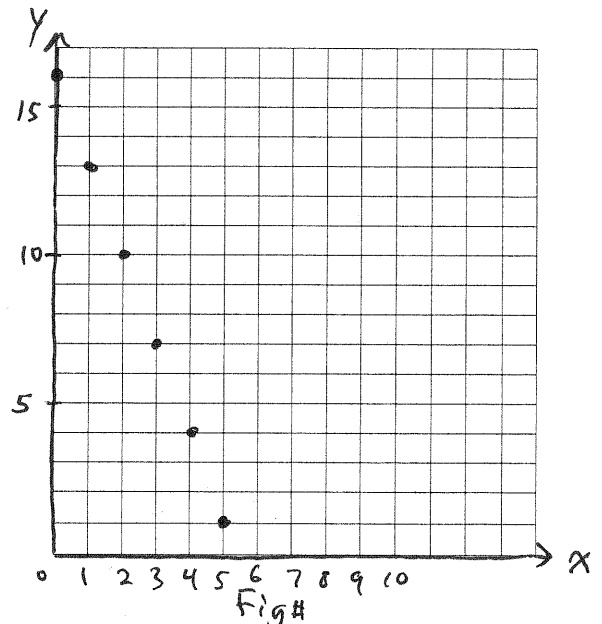


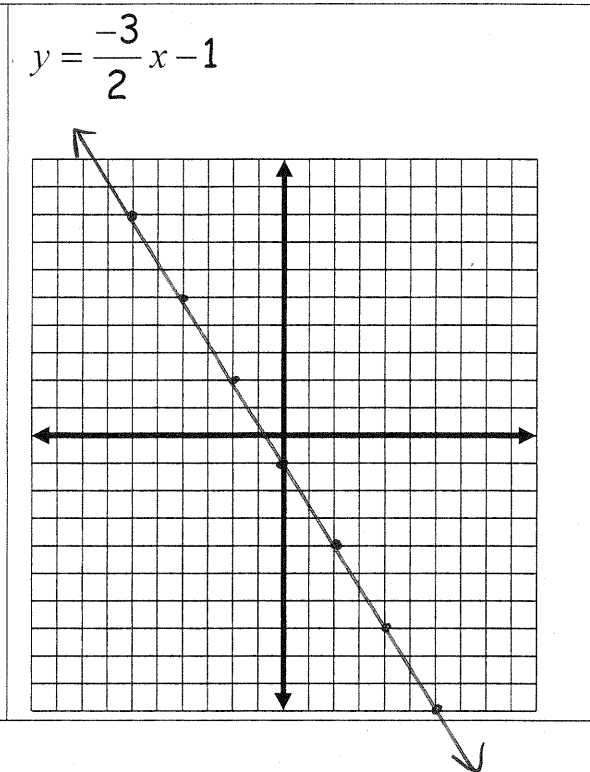
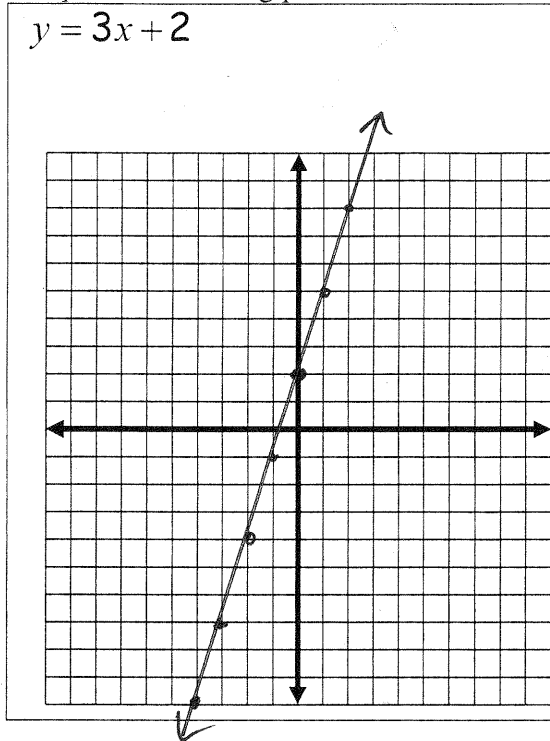
Figure #5

Rule (equation):

$y = -3x + 16$

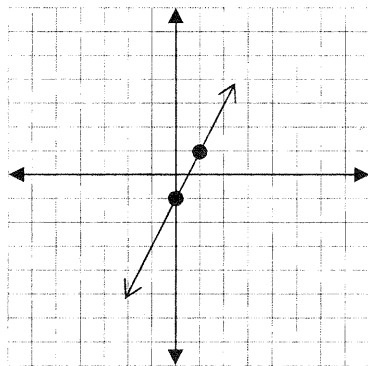


3. Graph the following patterns



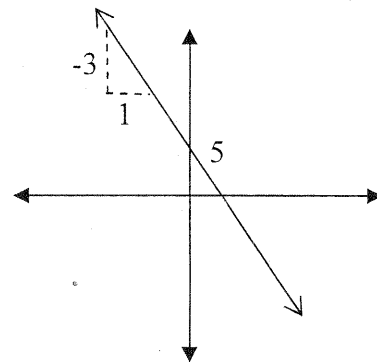
4. Write a rule (equation) for each graph below.

a.



Rule:  $y = 2x - 1$

b.



Rule:  $y = -3x + 5$

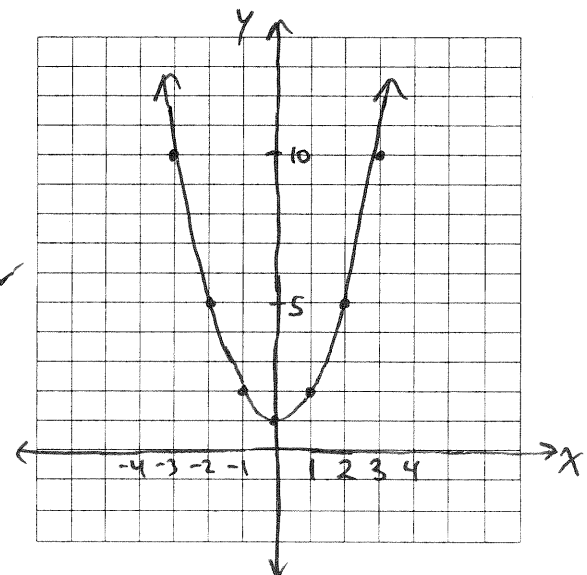
5. Complete the table below for the rule  $y = x^2 + 1$ .

$x$ (in)	-3	-2	-1	0	1	2	3
$y$ (out)	10	5	2	1	2	5	10

a. Plot the points and connect them on a complete graph. Done ✓

b. What does your graph look like?

The graph is a parabola, opening upward.

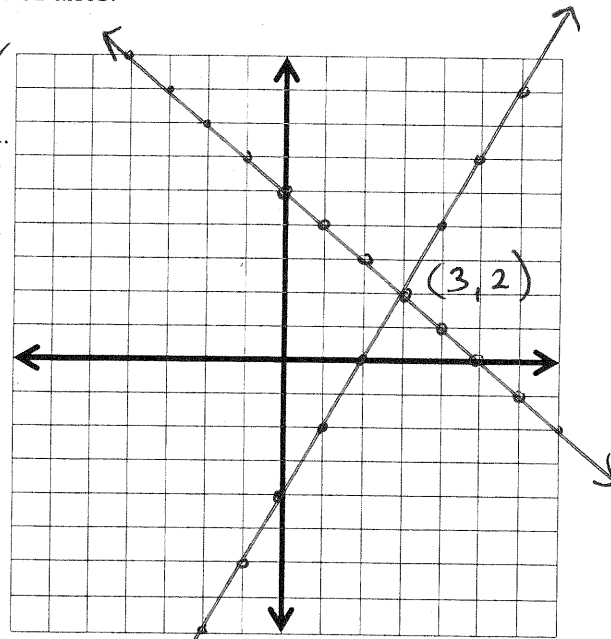


6. Graph the equations  $y = -x + 5$  and  $y = 2x - 4$  on the same set of axes.

- a. Label the point of intersection with its coordinates. Done ✓  
 b. Find the point of intersection using the Equal Value Method.

$$\begin{array}{r} -x + 5 = 2x - 4 \\ \underline{-2x} \quad \underline{-2x} \\ -3x + 5 = -4 \\ \underline{-5} \quad \underline{-5} \\ -3x = -9 \\ \underline{-3} \quad \underline{-3} \\ x = 3 \end{array}$$

$$\begin{aligned} y &= -x + 5 \\ y &= -(3) + 5 \\ y &= 2 \\ \therefore (3, 2) \end{aligned}$$



c. What is special about the point of intersection?

$(3, 2)$  is special because it is the only  $x$  and  $y$  pair that makes both equations true.

Eqn 1:  $2 = -(3) + 5$   
 Eqn 2:  $2 = 2(3) - 4$

7. Solve for  $x$

a.  $6x + 15 = -4x + 45$

$$\begin{array}{r} 6x + 15 = -4x + 45 \\ \underline{+4x} \quad \underline{+4x} \\ 10x + 15 = 45 \\ \underline{-15} \quad \underline{-15} \\ 10x = 30 \\ \underline{10} \quad \underline{10} \\ x = 3 \end{array}$$

b.  $3(x + 5) + 4(x - 5) = 5x + 13$

$$\begin{aligned} 3x + 15 + 4x - 20 &= 5x + 13 \\ 7x - 5 &= 5x + 13 \\ 2x &= 18 \\ x &= 9 \end{aligned}$$

8. Simplify the following

a.  $7x^2 - 5 - 2x - 3 + 5 - 3x^2 - 5x$

$$4x^2 - 7x - 3$$

b.  $4(x^2 - 3x + 2) + 5(x^2 + 3x - 2)$

$$4x^2 - 12x + 8 + 5x^2 + 15x - 10$$

$$9x^2 + 3x - 2$$

9. Find the value of each expression below. Remember the Order of Operations!

a.  $23 - (5 - 3 \cdot 2)^2 - 6 + 2$

$$\begin{aligned} 23 - (5 - 6)^2 - 6 + 2 \\ 23 - (-1)^2 - 6 + 2 \\ 23 - 1 - 6 + 2 \\ 18 \end{aligned}$$

b.  $(-4)(-2) - 6(2 - 5)$

$$\begin{aligned} 8 - 6(-3) \\ 8 + 18 \\ 26 \end{aligned}$$

10. Paco and his friend Fabienne like to collect and sell baseball cards. Paco has 125 cards and collects 2 new cards each week. Fabienne has 200 cards in his collection and sells 1 card each week. For the rules, let  $x$  represent the number of weeks and  $y$  represent the number of cards.

a. Find the time in weeks when Paco and Fabienne will have the same number of cards.

$$\left. \begin{array}{l} \text{Paco: } y = 2x + 125 \\ \text{Fab: } y = -x + 200 \end{array} \right\} \begin{array}{l} 2x + 125 = -x + 200 \\ \quad \quad \quad +x \quad \quad \quad +x \\ \hline 3x + 125 = 200 \\ \quad \quad \quad -125 \quad \quad -125 \\ \hline 3x = 75 \\ x = 25 \end{array}$$

Paco and Fabienne will have the same number of cards after 25 weeks.

b. How long will Paco to collect 500 cards?

$$500 = 2x + 125$$

$$\frac{375}{2} = \frac{2x}{2}$$

$$x = 187.5$$

It will take Paco  $187\frac{1}{2}$  weeks to collect 500 cards.

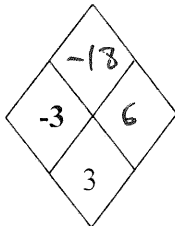
11. Mr. Heap's class played "Guess My Number." Mr. Heap said, "I'm thinking of a number. When I triple my number and subtract 10, I get twice my number plus 4." Write and solve an equation to find Mr. Heap's number. Be sure to write down each step as you go.

$$3x - 10 = 2x + 4$$

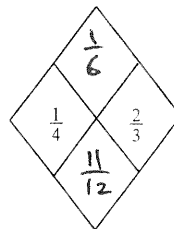
$$\boxed{x = 14}$$

12. Solve each of these Diamond Problems.

a.

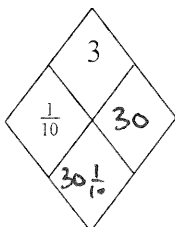


b.



$$\begin{aligned} & \frac{1}{4} + \frac{2}{3} \\ &= \frac{3}{12} + \frac{8}{12} \\ &= \frac{11}{12} \end{aligned}$$

c.



d.

