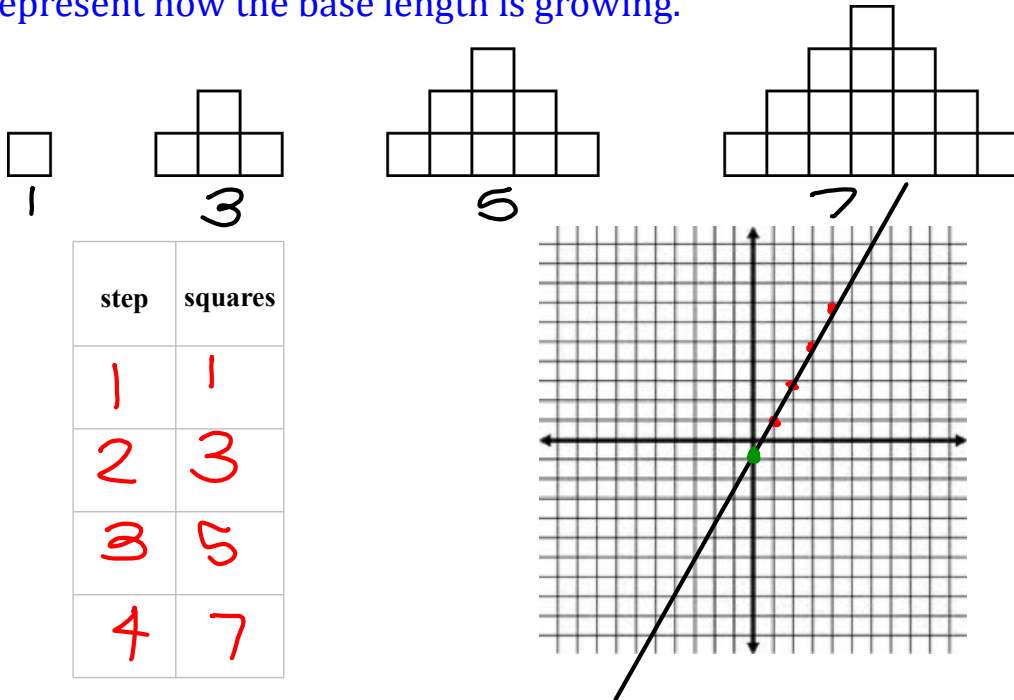


For the following pattern, create a table of values and graph to represent how the base length is growing.



Find the slope from your table. Slope: 2

From each end point on the line you graphed use the slope to plot 1 more point in each direction. This will extend our graph in both directions.

Write the coordinates for the y-intercept: (0,-1)

Now re-write your table of values to include the y-intercept

step	squares
0	-1
1	1
2	3
3	5

By adding in the y-intercept to the table, will the slope still be 2? Why or why not?

yes

Having the same change in the y values and the same change in the x values is called a COMMON Difference

The common difference in the y's and the common difference in the x's is what gives a constant slope between each of the points and graph's a straight line.

Now that we know that the slope is _____ and the _____-intercept is _____ we can write a rule or equation.

The y-intercept represents where to start from, or the _____ value. The initial value will always be where $x=0$. This means our initial value is how many blocks we have at step 0.

The slope represents the _____ of change. This tells us that we are growing by 2 blocks each step.

The variable represents how many times 2 blocks have been added from step to step. The amount of steps that will happen is unknown.

Write a rule, or equation, for the pattern above.

Variable represents:

Rate of Change: 2

Initial value: -1

Rule:

$$y = 2x - 1$$

*Slope
rate of
change*

*y-int
where you
start*

Where do you see the parts of the rule in the table and the graph?

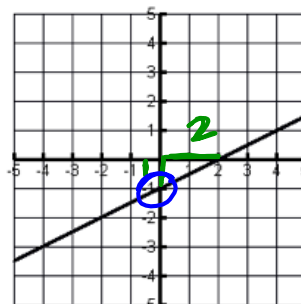
Find the rate of change (slope) and the initial value (y-intercept) for each of the following and then write a rule.

x	y
0	3
1	0
2	-3
3	-6

1 <
1 <
1 <

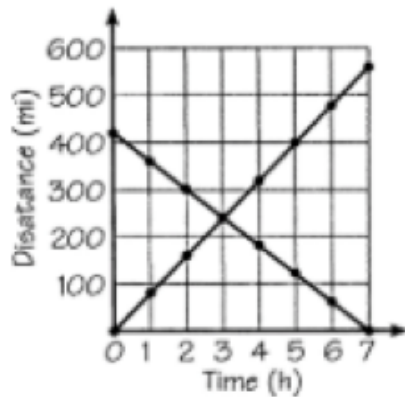
-3
 Rate of change: *-3*
 Initial value: *3*
 Rule: *y = -3x + 3*

-3
-3



Rate of change: *1/2*
 Initial value: *-1*
 Rule: *y = 1/2x - 1*

Find the rate of change that represents each line.

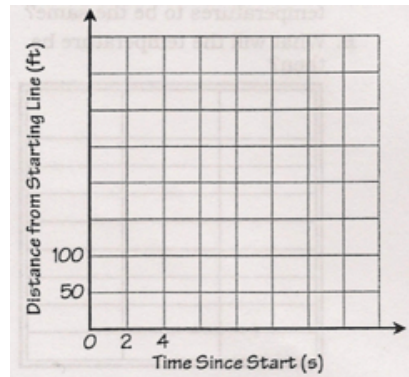


For the following situation, fill in the table of values, create a graph, and write 2 equations

Wild Animal Race.

The zebra and the hippo had a race. The zebra gave the hippo a 100-ft head start. The zebra ran at an average speed of 22 ft/s while the hippo ran at an average speed of 15 ft/s. Show how the distance of each animal from the starting line is a function of the time since the race started.

Time (s)	Distance (ft)	
	Hippo	Zebra
0		
2		
4		
6		
8		
10		
12		
14		
16		



Hippo Equation:

Zebra Equation:

Jack is buying a new stereo system for his car using a layaway plan. The plan is \$75 down and \$10 each week.

a. Write an equation for the total amount, P , that he has paid after w , weeks.

$$y = 10x + 75$$

b. How much will Jack have paid after 8 week?

$$\begin{aligned} y &= 10(8) + 75 \\ &= 80 + 75 \\ &= 155 \end{aligned}$$

The band is having a fundraiser and selling sandwiches for \$5 each. They bought \$1160 in ingredients to make the sandwiches.

1. Write a rule for the profit P made on n sandwiches.

1. Find the total profit is 1200 sandwiches are sold.

The linear equation $y = \frac{mx}{1} + \frac{b}{1}$ is written in **slope-intercept form**. The slope of the line is m . The y-intercept is b .

Find the slope and y- intercept of the graph of the equation

Equation	Slope	y-intercept
$y = 2x + 1$	2	1
$y = -2x - 3$	-2	-3
$y = x + 4$	1	4
$y = 0.5x - 2.5$	0.5	-2.5

Writing equations in Slope-Intercept Form

To write an equation in slope-intercept form we want to have one side be y and everything else on the other side, y = stuff.

Write the following equations in slope-intercept form, identify the slope and the y-intercept.

Equation	Slope-Intercept Form	Slope	y-intercept
$y = -x + 2$	✓	-1	2
$y = \frac{x+3}{2}$	$y = \frac{x}{2} + \frac{3}{2}$	$\frac{1}{2}$	$\frac{3}{2}$
$y = -4$	$y = 0x - 4$	0	-4
$2x - 4y = 16$ $+4y + 4y$ $2x = 16 + 4y$ $-16 - 16$ $2x - 16 = 4y$ $\frac{2x - 16}{4} = \frac{4y}{4}$	$y = \frac{1}{2}x - 4$	$\frac{1}{2}$	-4

Ex. 1 Writing an equation of a line

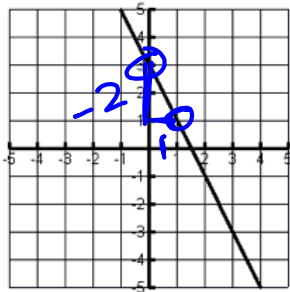
1. $m = -2$ $b = 5$

2. $m = 6$ $b = -3$

3. $m = \frac{1}{2}$ $b = \frac{5}{3}$

$y = -2x + 5$

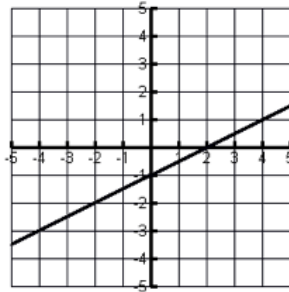
Ex. 2 Use the graph to write an equation



$m = -2$

$b = 3$

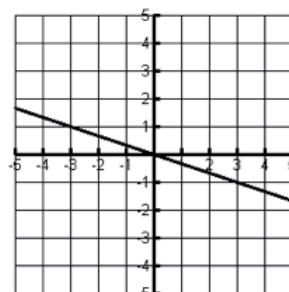
equation: $y = -2x + 3$



$m = \underline{\hspace{2cm}}$

$b = \underline{\hspace{2cm}}$

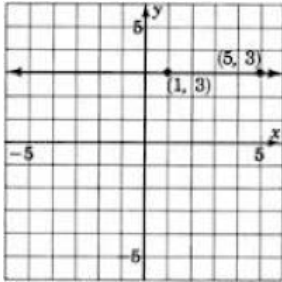
equation: $\underline{\hspace{4cm}}$



$m = \underline{\hspace{2cm}}$

$b = \underline{\hspace{2cm}}$

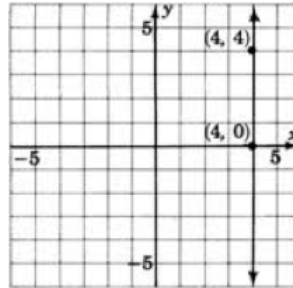
equation: $\underline{\hspace{4cm}}$



$$m = \underline{0}$$

$$b = \underline{3}$$

$$\text{equation: } \underline{y = 3}$$



$$m = \underline{\text{undefined}}$$

$$b = \underline{\quad}$$

$$\text{equation: } \underline{x = 4}$$