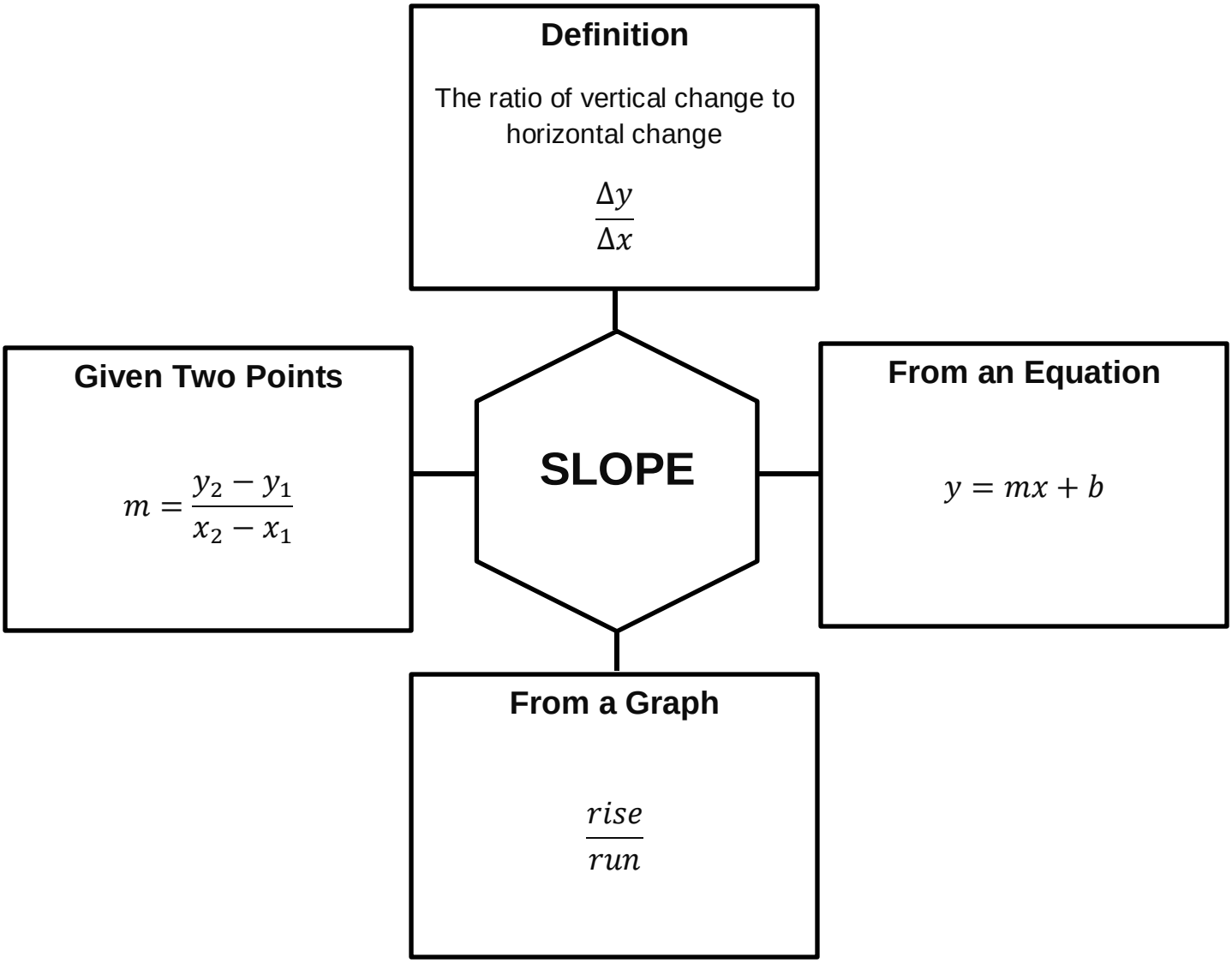
Name _____**Hr** _____

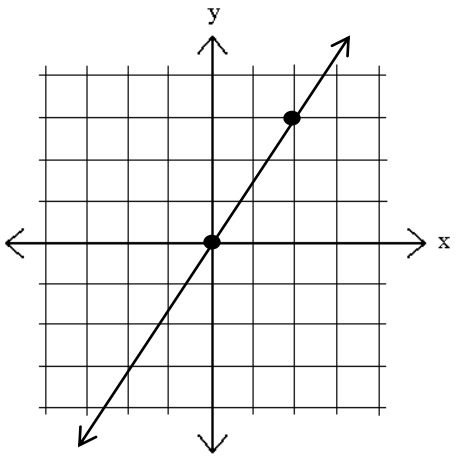
Lesson 2.2: Slope and Rate of Change



Ex 1: Find the slope of the line passing through (-1, 5) and (2, 3).

Ex 2:

Find the slope of the line below.



Positive slope: rises from left to right

Negative slope: falls from left to right

Zero slope: a horizontal line

Undefined: a vertical line

Ex 3:

Find the slope of the line below.

$2y = -2x + 4$

Parallel and Perpendicular Lines

Parallel Lines: 2 lines on the same plane which never intersect; same slope

$y = \frac{1}{2}x + 2$; write the equation of a parallel line

Perpendicular Lines: 2 lines on the same plane which intersect at a $90°$ angle; have OPPOSITE RECIPROCAL slopes

$y = \frac{1}{2}x + 2$; write the equation of a perpendicular line

Ex 4: Are these lines parallel/perpendicular/or neither?

Line A passes through (1,-2) and (3,-2)

Line B passes through (-5,4) and (0,4)

Ex 5: Are these lines parallel/perpendicular/or neither?

Line A passes through (3,6) and (2,-1)

Line B passes through (-1,2) and (6,1)

Lesson 2.3: Quick Graphs of Linear Equations

Slope Intercept Form: $y = mx + b$

Standard Form: $ax + by = c$

x-intercept: the point where a graph passes the x-axis; the _____ value is zero

y-intercept: the point where a graph passes the y-axis; the _____ value is zero

**Horizontal lines will always be in the form _____

**Vertical lines will always be in the form _____

Graphing from Slope Intercept form

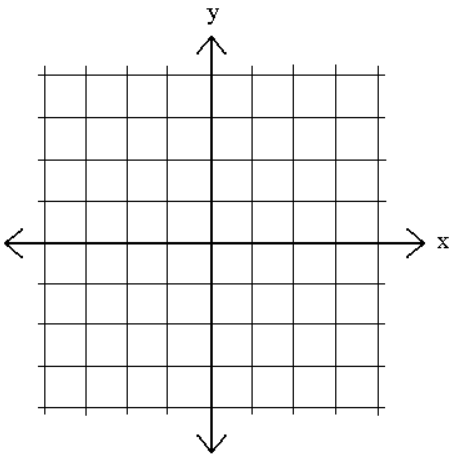
1. Graph the point of the _____.
2. From the y-intercept use the _____ to find the next point
3. Connect the two points and extend the line with a ruler and add arrows

Graphing from Standard Form

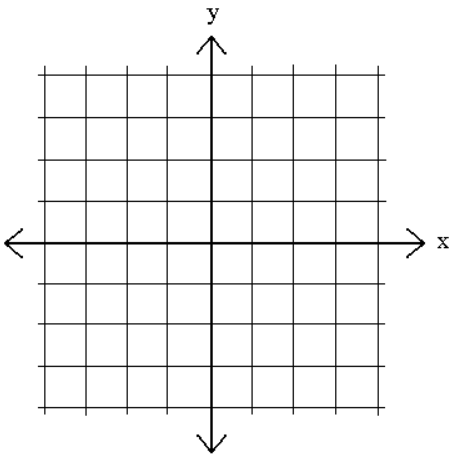
1. Find the x-intercept by substituting 0 for _____
2. Find the y-intercept by substituting 0 for _____
3. Plot the x- and y-intercepts, connect with a straight line and add arrows

Ex1: Graph the following:

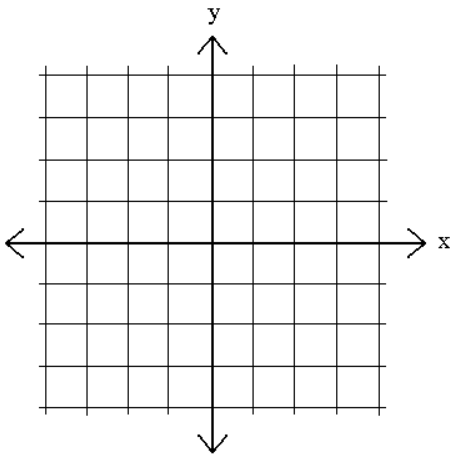
a. $y = \frac{1}{2}x - 2$



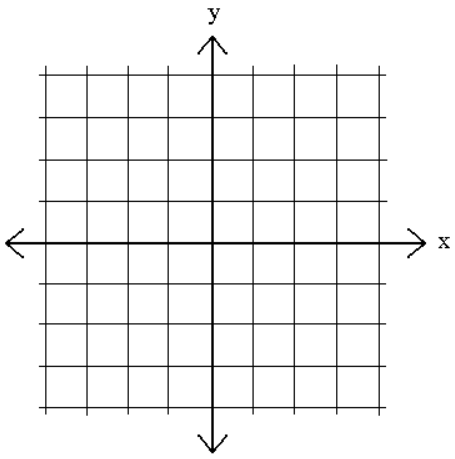
b. $3x - 4y = 12$



c. $x = 4$



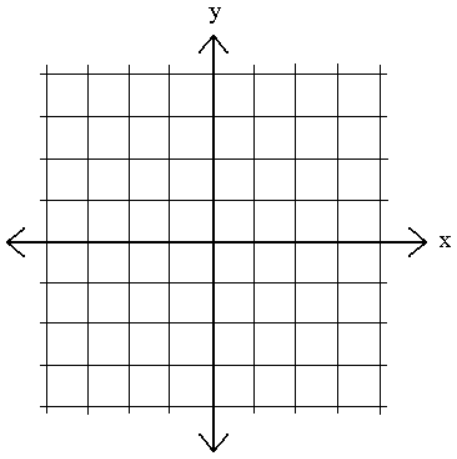
d. $y = -2$



Ex 2: To buy a $1200 car you pay a $200 deposit and make weekly payments according to the equation $a = 1000 - 40t$ where a is the amount you owe and t is the number of weeks

a. What is your weekly payment?

b. Graph the equation



c. How many weeks will it take to pay off?

Ex 3: Students are selling tickets to a school play. The goal is to raise $600. Tickets are $4 for adults and $3 for students. How many of each ticket could be sold to reach our goal?

Lesson 2.4: Writing Equations of Lines

Recall:

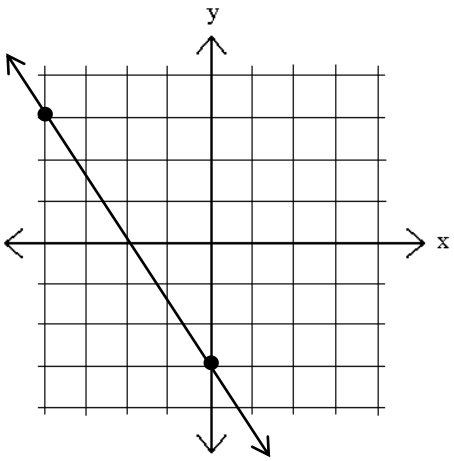
Slope Intercept Form: $y = mx + b$

Standard Form: $ax + by = c$

New

Point-Slope Form: $y - y_1 = m(x - x_1)$

Ex 1: Write the equation for the line drawn

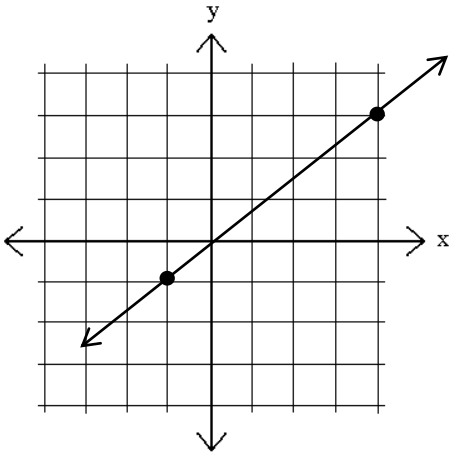


y-intercept: _____

Slope: _____

Equation: _____

Ex 2: Find the equation for the line below



Slope: _____

Equation: _____

Ex 3: Write an equation of a line that passes through (-3, 4) and a slope of $\frac{2}{3}$

Recall:

Parallel lines have the _____ slope

Perpendicular lines have the _____ slope

Ex 4: Write the equation of a line that passes through (2, -3) and is parallel to $y = 2x - 3$

Ex 5: Write the equation of a line passing through the points (4, -6) and (3, -4)

1.
2.
3.

Ex 6: In 1984 Americans purchased an average of 113 meals of snacks at restaurants. By 1996 this number was 131. Write a linear model for the number of meals or snacks purchased per person annually. Then predict the number of meals that will be purchased in 2006.

DAY 2 **Direct Variation**

Recall:

$y = mx + b$ is a linear equation

$y = mx$ is a linear equation with y-intercept 0

$y = mx$: shows direct variation where $m \neq 0$

written $y = kx$, where k is the constant of variation

Ex 1: You receive $0.10 per can in MI for recycling. Write an equation to model

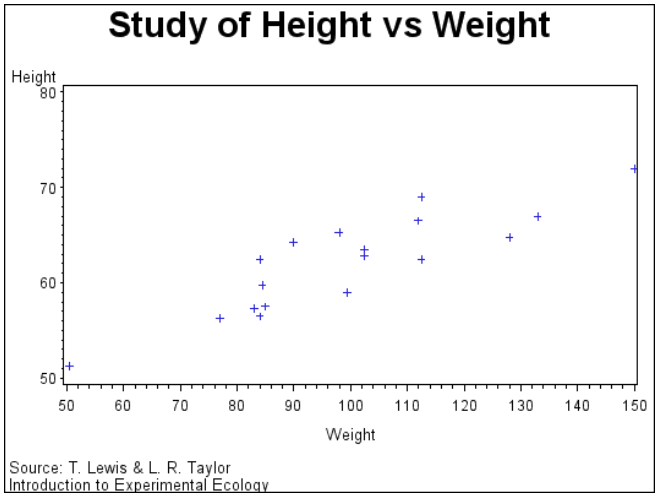
**This is direct variation because the _____ cans you cash in the _____ $ you receive

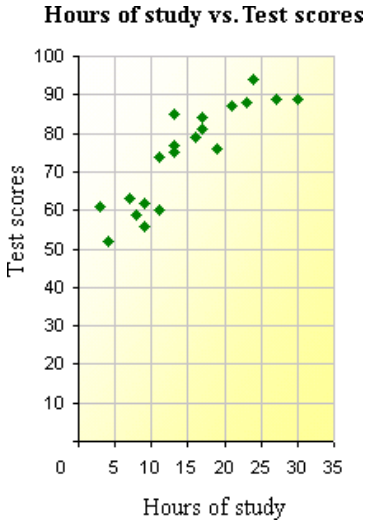
Ex 2: y varies directly as x and $y = 15$ when $x = 3$. Write the equation.

Ex 3: y varies directly as the cube of x. If $y = 24$ when $x = 2$ find y if $x = 3$

Lesson 2.5: Correlation and Best Fitting Lines

Scatter plot: graph used to determine whether there is a relationship between paired data





Why look at correlation and the line of best fit?

_____

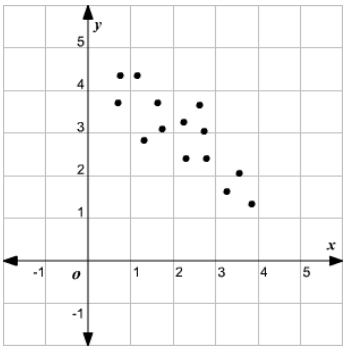
_____

Positive correlation: y tends to _____ as x _____

Negative correlation: y tends to _____ as x _____

No correlation: no linear pattern

Ex 1: Tell whether each graph show a negative correlation, positive correlation, or relatively no correlation.



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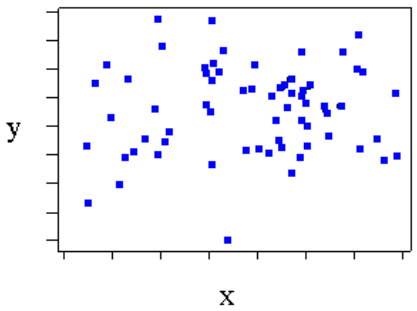

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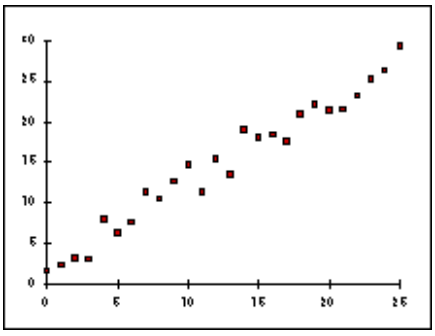


_____

Finding line of best fit: See 2.5 Calculator assignment

Ex 2: Approximate the best-fitting line for the data.

x	0	1	2	3	4	5	6
y	4269	4392	4570	4785	4971	5109	5730

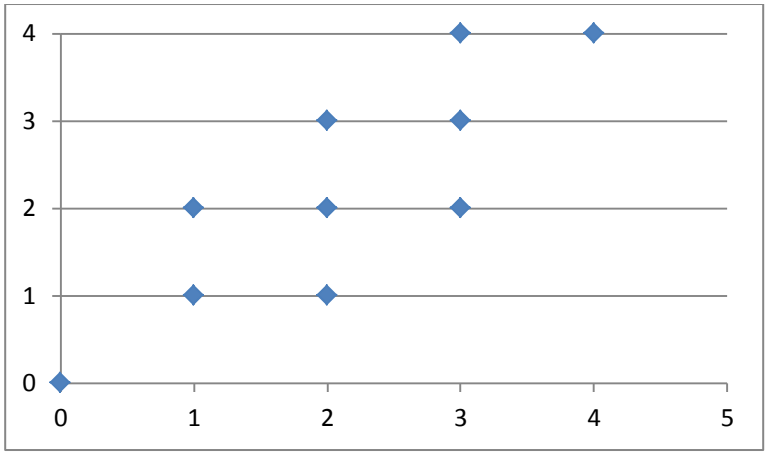
a= _____

b= _____

r= _____

Equation: _____

Ex 3: Approximate the best-fitting line for the data below.



a= _____

b= _____

r= _____

Equation: _____

Lesson 2.6: Linear Inequalities in Two Variables

Recall:

Standard Form: $ax + by = c$

Linear Inequalities: contains $<, >, \leq, \geq$ instead of =; used for finding maximums, minimums, tolerances, etc.

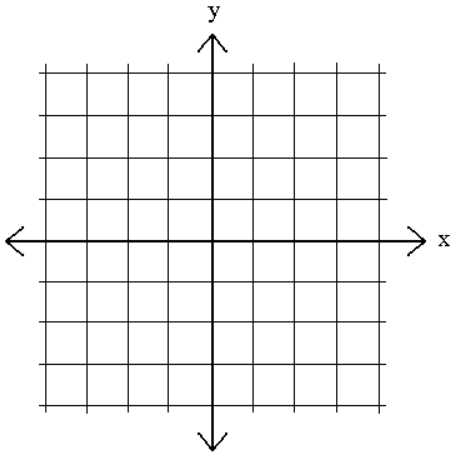
Boundary Line: Line which denotes start/end of the solution area. Line is dashed for (< >). Line is solid for ($\leq \geq$)

Test Point: a point on either side of the boundary. We plug the test point in to the inequality. If the result is true the test point is on the solution side, if the result is false the solution area is on the other side

Remember:
If you multiply or divide by a negative number, reverse the sign!

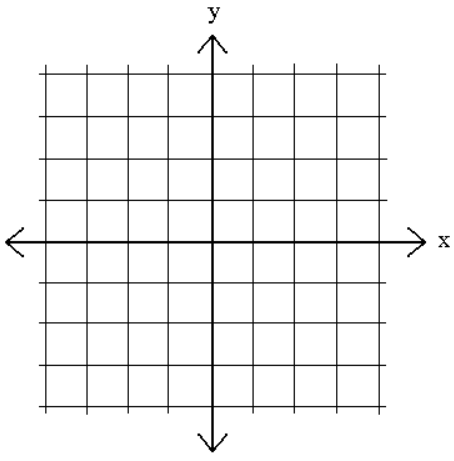
Ex 1:

a. Graph $x < 2$



Test Point: _____

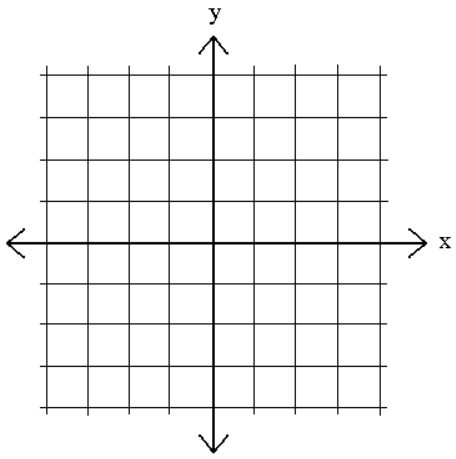
b. Graph $y \geq -3$



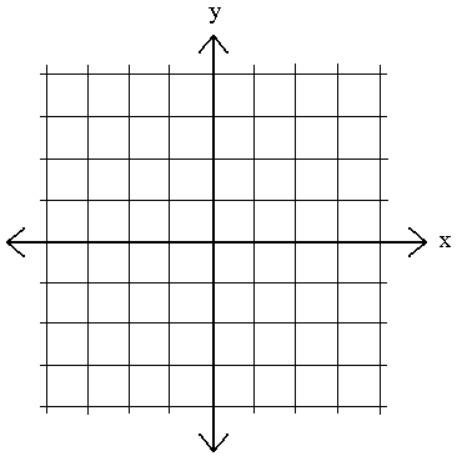
Test Point: _____

Ex 2:

a. Graph $y > -\frac{1}{2}x + 2$



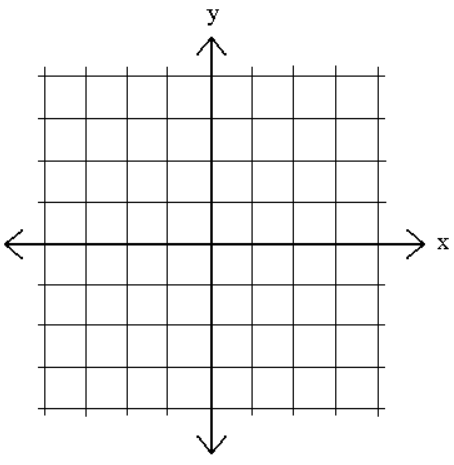
b. Graph $4x - 2y \leq 8$



Ex 3: You have \$200 to spend on books and blue-rays. Books cost \$10 and blue-rays cost \$15.

a. Write a linear inequality to represent the # of books (x) and blue rays (y) you can buy.

b. Graph it.



Lesson 2.7: Piecewise Functions

Review:

Evaluate $f(x) = \begin{cases} 2x - 1, & x \leq 3 \\ 3x + 5, & x > 3 \end{cases}$ for the given value of x

a. $x = 4$

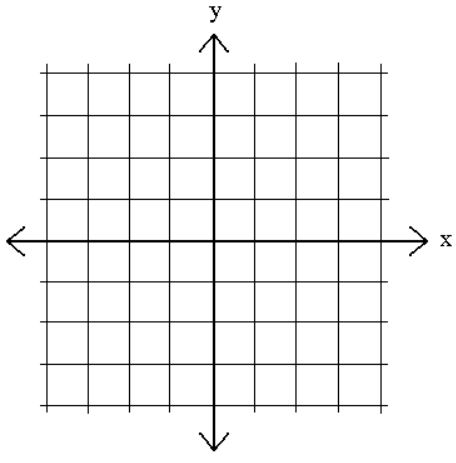
b. $x = 3$

Piecewise function: where more than one equation is needed to represent a situation; multiple graphs pieced together

Remember:
Open circle: < >
Closed circle: ≤ ≥

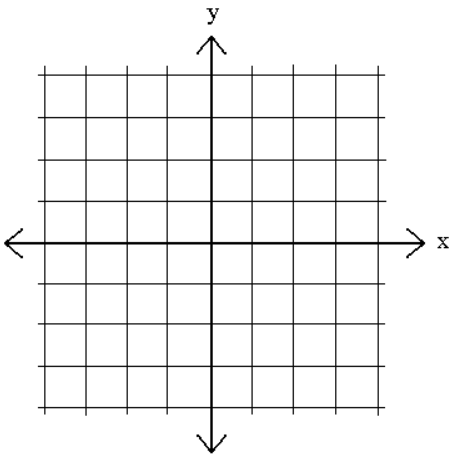
Ex 1:

Graph $f(x) = \begin{cases} 2, & x < 3 \\ x - 1, & x \geq 3 \end{cases}$



Ex 2:

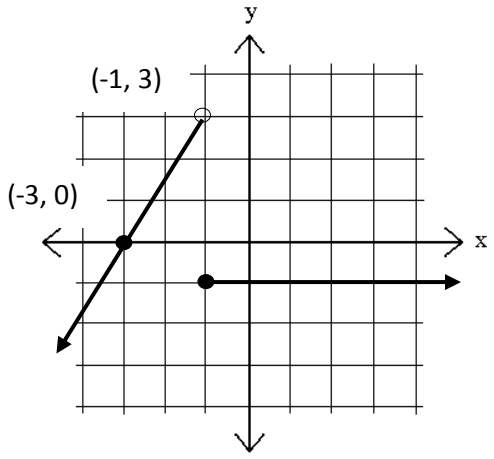
Graph $f(x) = \begin{cases} 1, & 0 \le x < 1 \\ 2, & 1 \le x < 2 \\ 3, & 2 \le x < 3 \\ 4, & 3 \le x < 4 \end{cases}$



** This is called a _____ function.

Ex 3:

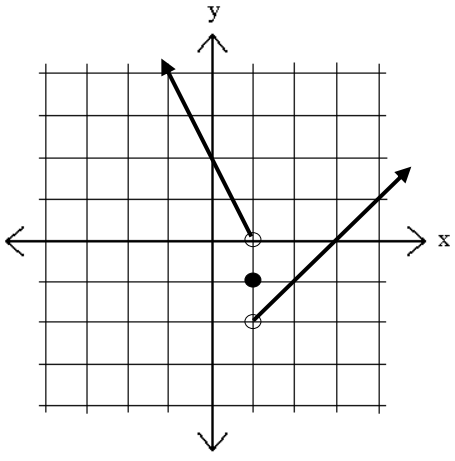
Write an equation for the piecewise function shown on the graph below.



Equation: _____

Ex 4:

Write an equation for the piecewise function shown on the graph below.



Equation: _____