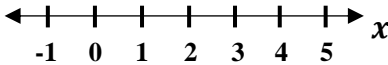
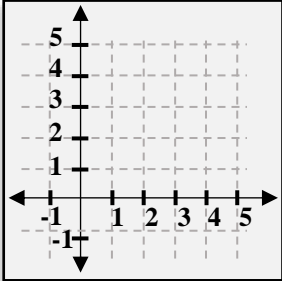


## TOPIC: EQUATIONS OF TWO VARIABLES

### Solving Two Variable Equations

- Instead of just ONE variable, many equations in this course will involve TWO variables: \_\_\_\_ & \_\_\_\_

Equations with ONE Variable	Equations with TWO Variables
$x + 2 = 5$ $x = 3$  Solution: _____ <b>point (x)</b> on a 1D line	$x + y = 5$ $x = ?$ $y = ?$  Solution(s): _____ <b>points</b> _____ on a 2D plane

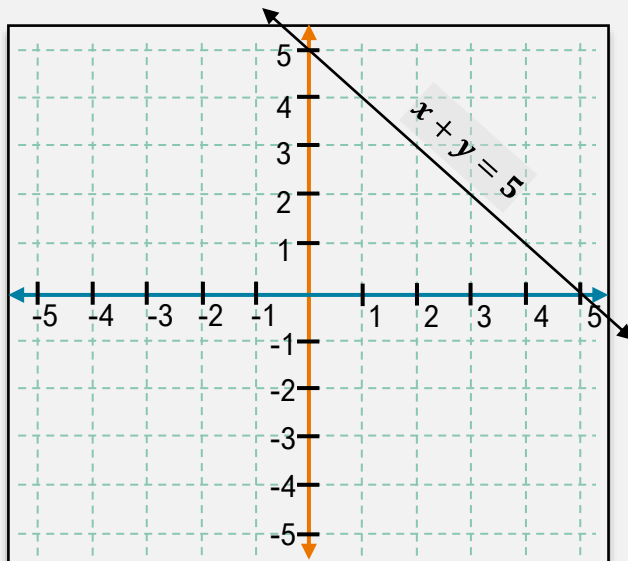
- If asked to determine if points  $(x, y)$  “satisfy” an equation, \_\_\_\_\_  $x$  &  $y$  values to check if equation is true.

- The **graph** of an equation is just a visual representation of all  $(x, y)$  which make equation true.

When points **DO** satisfy an equation, they [ **ARE | ARE NOT** ] on the graph of that equation.

When points **DO NOT** satisfy an equation, they [ **ARE | ARE NOT** ] on the graph of that equation.

**EXAMPLE:** The graph of the equation  $x + y = 5$  is a line, as shown in the diagram below. **a)** Determine if the points  $(3, 2)$ ,  $(4, 1)$ ,  $(0, 0)$ , &  $(-1, 3)$  satisfy the equation. **b)** Plot each of the points on the graph.



## TOPIC: EQUATIONS OF TWO VARIABLES

### Graphing Two Variable Equations by Plotting Points

- To graph an equation, calculate & plot \_\_\_\_\_ that make the equation true.

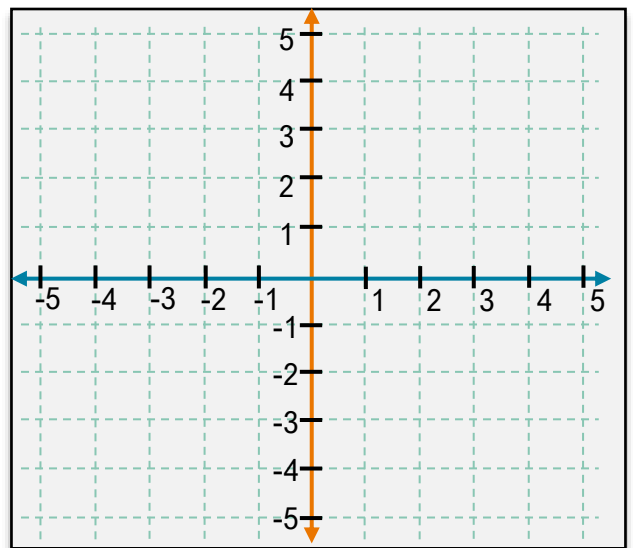
EXAMPLE: Graph the equation  $-2x + y = -1$  by creating ordered pairs using  $x = -2, -1, 0, 1, 2$ .

$x$		$y$	Ordered pair ( $x, y$ )
-2			
-1			
0			
1			
2			

- If you're not *given*  $x$ -values to evaluate, choose your own!

#### GRAPHING BY PLOTTING POINTS

- 1) Isolate  $y$  to left side:  $y = \dots$
- 2) Calculate  $y$ -values from 3-5 chosen  $x$ -values
- 3) Plot  $(x, y)$  points from Step 2
- 4) Connect points with line/curve



**TOPIC: EQUATIONS OF TWO VARIABLES**

PRACTICE: Graph the equation  $y - x^2 + 3 = 0$  by choosing points that satisfy the equation.

$x$		$y$	Ordered Pair $(x,y)$

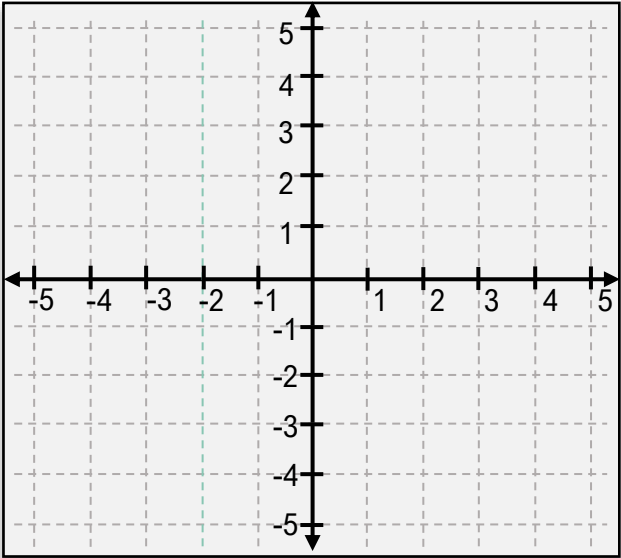
GRAPHING BY PLOTTING POINTS

1) Isolate  $y$  to left side:  $y = \dots$

2) Calculate  $y$ -values from 3-5 chosen  $x$ -values

3) Plot  $(x,y)$  points from Step 2

4) Connect points with line/curve



**TOPIC: EQUATIONS OF TWO VARIABLES**

PRACTICE: Graph the equation  $y = \sqrt{x} + 1$  by choosing points that satisfy the equation. (*Hint: Choose positive numbers only*)

$x$		$y$	Ordered Pair

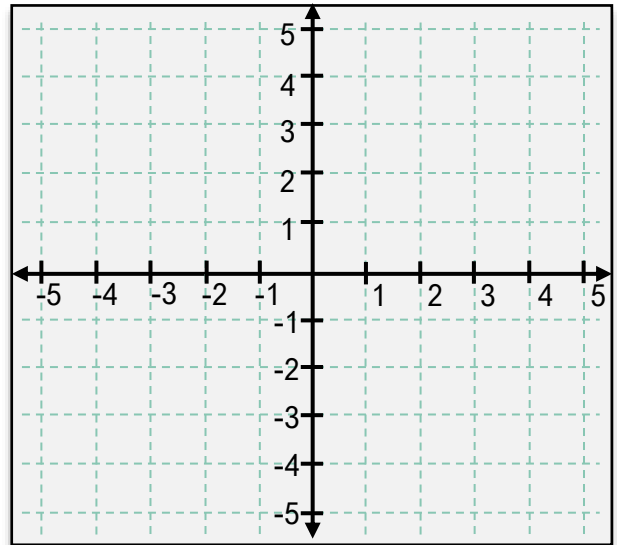
GRAPHING BY PLOTTING POINTS

1) Isolate  $y$  to left side:  $y = \dots$

2) Calculate  $y$ -values from 3-5 chosen  $x$ -values

3) Plot  $(x, y)$  points from Step 2

4) Connect points with line/curve

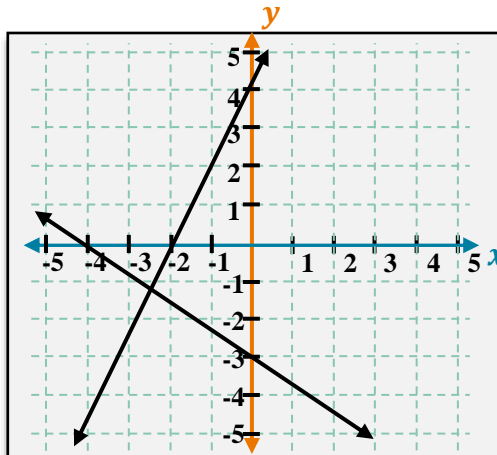


## TOPIC: EQUATIONS OF TWO VARIABLES

### Graphing Intercepts

**INTERCEPTS:** Ordered pairs/point(s) where graph crosses  $x$  or  $y$  axis

$x$  – intercept



$y$  – intercept

$x$  – Intercept

$x$  – intercept:  $x$  value when graph crosses  $[x | y]$  axis

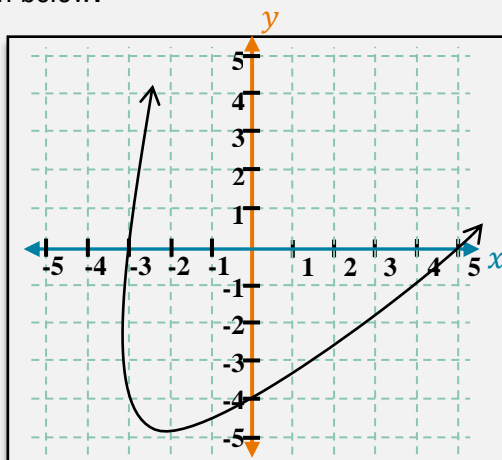
$[x | y]$  value is ALWAYS zero

$y$  – Intercept

$y$  – intercept:  $y$  value when graph crosses  $[x | y]$  axis

$[x | y]$  value is ALWAYS zero

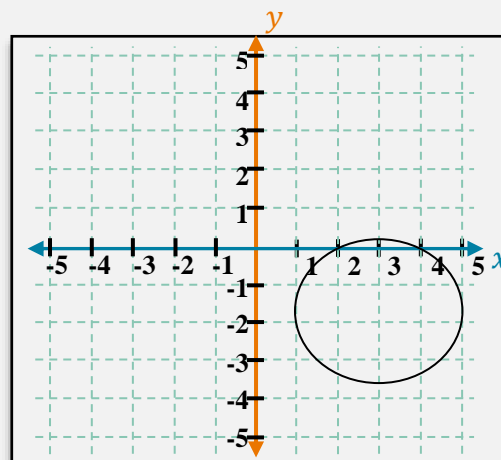
**EXAMPLE:** Write the  $x$ -intercepts &  $y$ -intercepts of the graph below.



$x$  – intercept: \_\_\_\_\_

$y$  – intercept: \_\_\_\_\_

**EXAMPLE:** Find the intercepts of the graph below.



Intercepts: \_\_\_\_\_

- If asked for “ $x$ - or  $y$ -intercept”, simply write the  $x$  or  $y$ -value. If asked for just “intercepts”, write the ordered pairs.