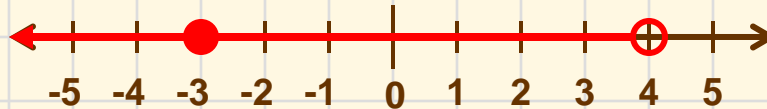
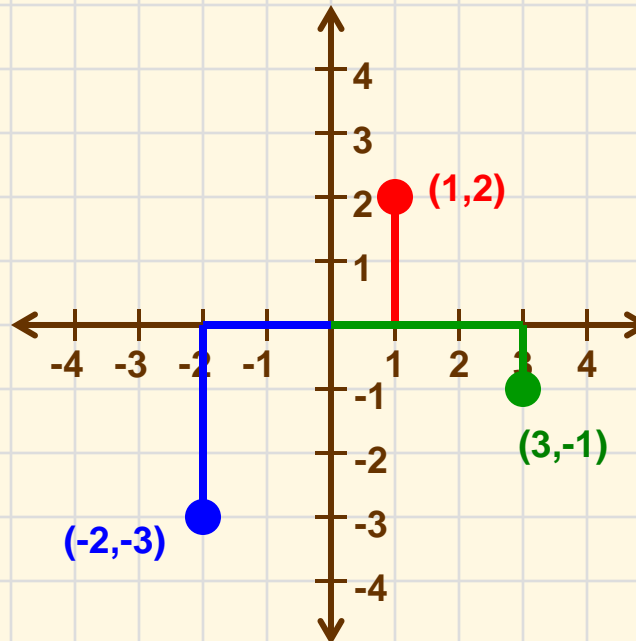
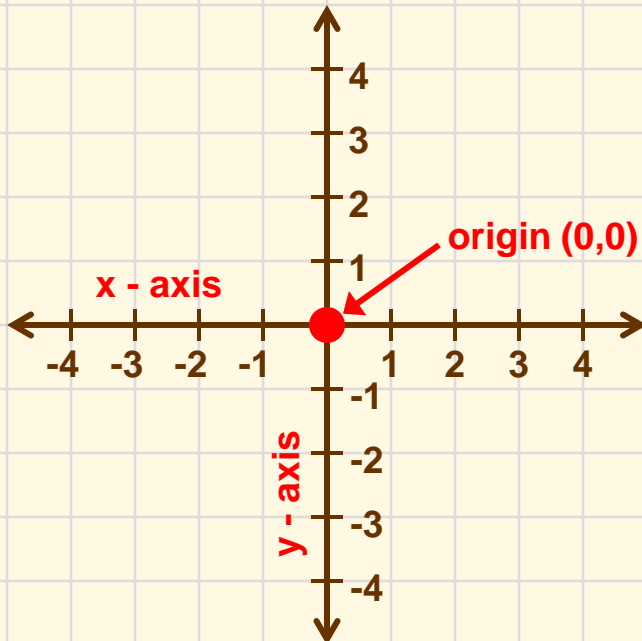


Rectangular Coordinate System

- In pre-algebra, we used number lines to plot numbers and equations and inequalities of 1 variable ($x = -3$, $x < 4 \Rightarrow$ one-dimensional)



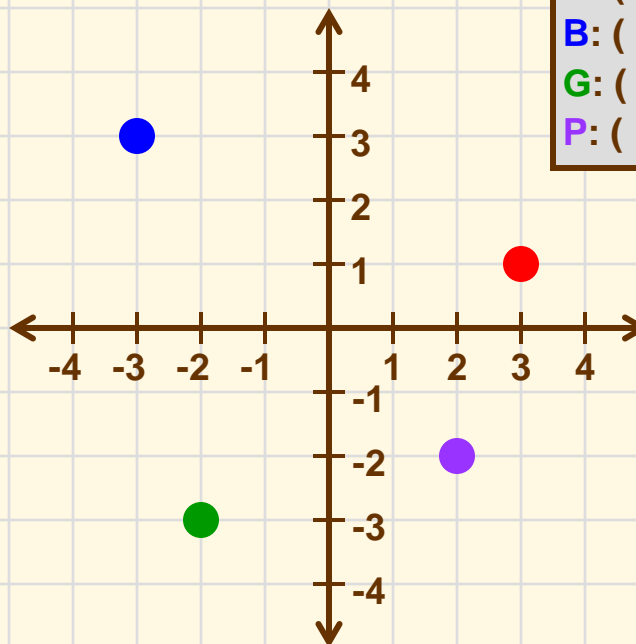
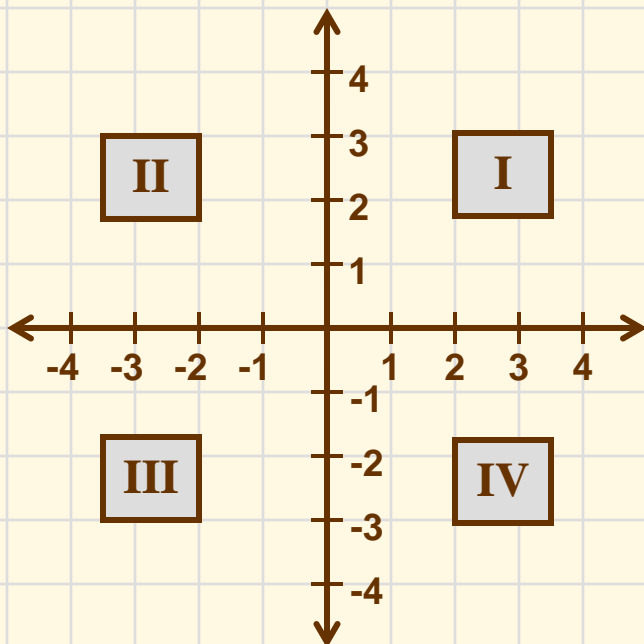
- To examine equations involving 2 variables, we graph on a rectangular (Cartesian) coordinate system ($y = x$, $y = x - 1 \Rightarrow$ two-dimensional)
- On a plane, each point is a pair of numbers $\Rightarrow (1,2)$; $(-2,-3)$; $(3,-1)$



Quadrants and Finding Coordinates

- Coordinates like $(2,3)$ are called ordered pairs and are of the form (x,y) , where x is the x -coordinate, and y is the y -coordinate
- Graphs can be divided into 4 quadrants
 - Quadrant I \Rightarrow both coordinates are positive
 - Quadrant II \Rightarrow 1st-coordinate negative / 2nd-coordinate positive
 - Quadrant III \Rightarrow both coordinates are negative
 - Quadrant IV \Rightarrow 1st-coordinate positive / 2nd-coordinate negative

Bonus: Plot the points $(-1,-3)$, $(3/2,5/2)$, and $(3,4)$

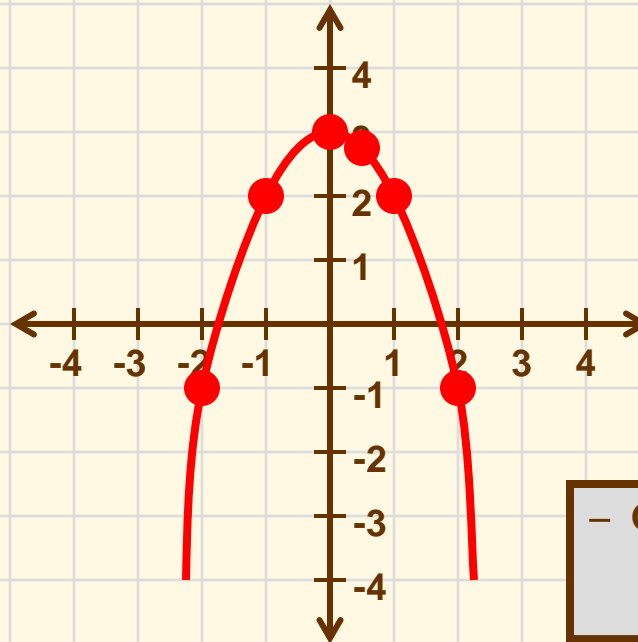


R:	()
B:	()
G:	()
P:	()

Solutions of Equations

- To determine if an ordered pair is a solution of an equation, we use the 1st number in the pair to replace the variable that occurs 1st *alphabetically*
- The solution of an equation in 2 variables (typically x and y) is an ordered pair which when substituted into the equation give a true statement
- Because of this, we can generate ordered-pair solutions to equations to graph
 - Substituting $x = 2$ into $y = 3 - x^2$ gives an ordered pair solution of $(2, \quad)$
 - Show that $(-2, -1)$ is a solution to $y = 3 - x^2$
 - Graph $y = 3 - x^2$ by using numbers from -2 to 2 for x and finding the coordinates

x	y
-2	-1
-1	
0	
0.5	
1	
2	



- Graph $y = |x|$ and $y = 2x - 1$ on the board with time

Identifying Intercepts

- A y-intercept of a graph is a point where the graph intersects the y-axis (this is also the point where $x = 0$)
- An x-intercept of a graph is a point where the graph intersects the x-axis (this is also the point where $y = 0$)
- Two graphs intersect each other at any point where their x-coordinates and y-coordinates are the same
- Find the x and y intercepts for the following...

Red:

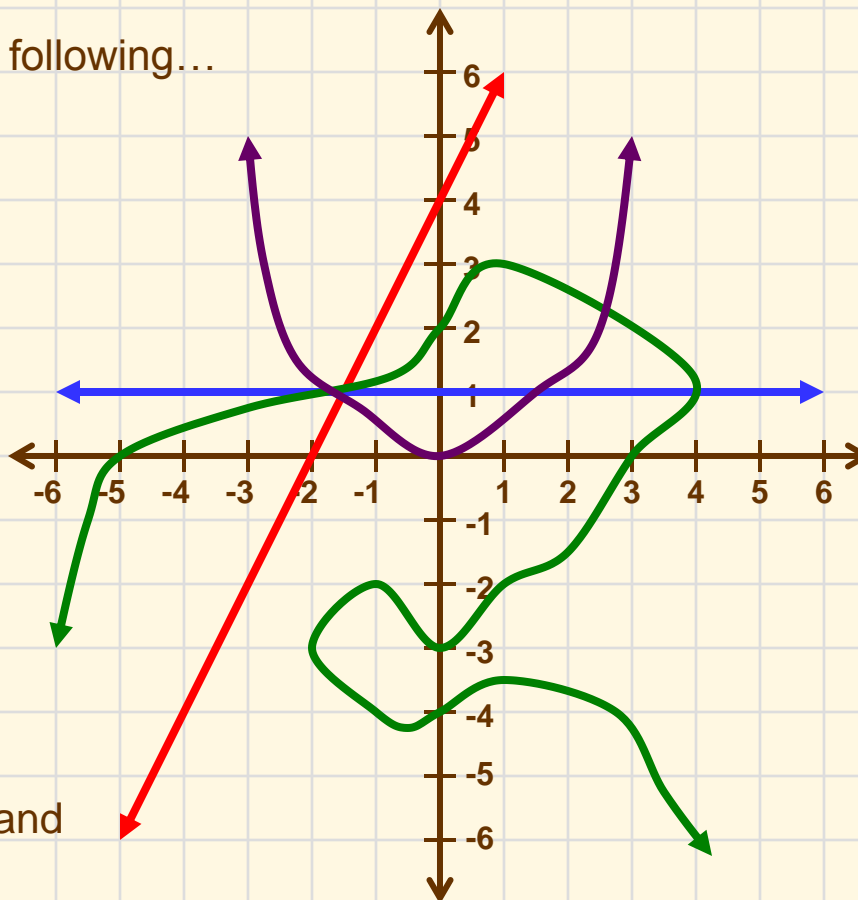
Blue:

Green:

Purple:

$$2x + 5y = 10:$$

$$y = 4 - x^2:$$



- Bonus: At what points do the blue and green graph intersect each other?

Interpreting Graphs

Book problems: 1, 3, 5, 9, 11, 13, 17, 23, 39, 45, 57

- Line graphs are often used to show trends over time or a range
- By identifying points on line graphs and their coordinates, you can interpret specific information given in the graph

- How many rushing yards did the Hokies have in 2008? In 2012?
- How many passing yards did the Hokies have in 2012?
- For the period given, what is the biggest total of rushing yards in a season for the Hokies and in what season?
- Around how many more passing yards did VT have than rushing yards in 2013?
- How many more yards passing did the Hokies have in 2010 than the previous season (Δy)?

