

Review of Graphing, Intercepts, Symmetry Video Lecture

Section 1.1 and 1.2

Course Learning Objectives:

- 1) Demonstrate an understanding of functional attributes such as symmetry. Determine these attributes for a function given its graph and/or its rule.**
- 2) Graph absolute value, square root, greatest integer and polynomial functions.**
- 3) Identify and articulate the significance of graphical components such as x-intercepts in a mathematical model/application.**

Weekly Learning Objectives:

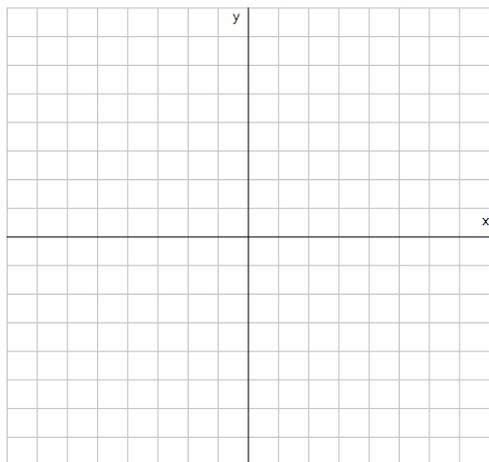
- 1) Use the distance formula.**
- 2) Use the midpoint formula.**
- 3) Find intercepts from a graph.**
- 4) Find intercepts algebraically from an equation.**
- 5) Test an equation for symmetry with respect to the x-axis, y-axis and the origin.**
- 6) Know how to graph key equations – linear, quadratic, absolute value, greatest integer, radical, circles.**
- 7) Find the equation of a circle.**

Review of Graphing, Intercepts and Symmetry

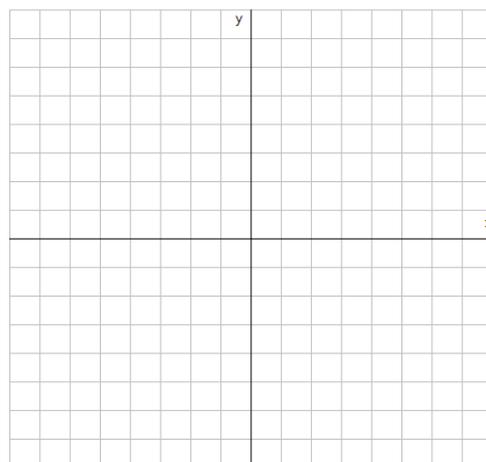
Definition of a graph of an equation or an inequality:
the set of all points (x,y) that satisfy the equation or inequality.

Sketch the following graphs:

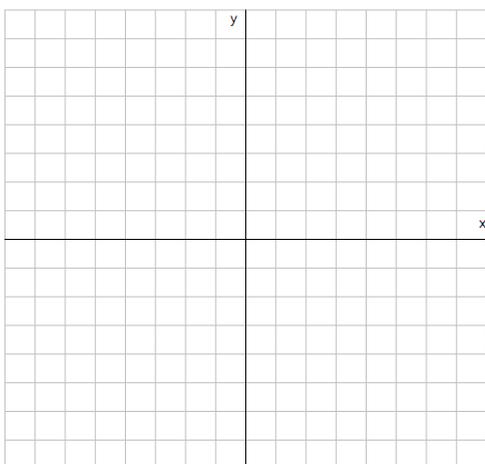
$$y = 3x - 2$$



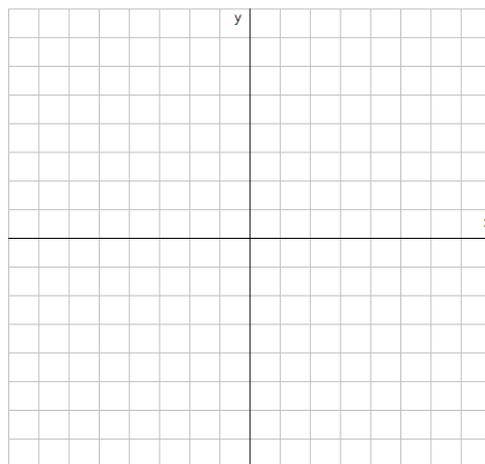
$$y = x^2 - 4$$



$$y = \sqrt{x}$$

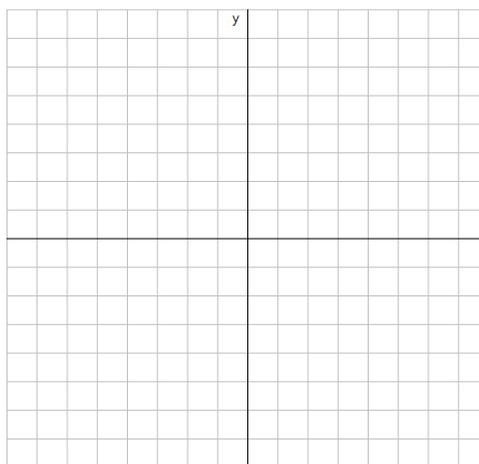
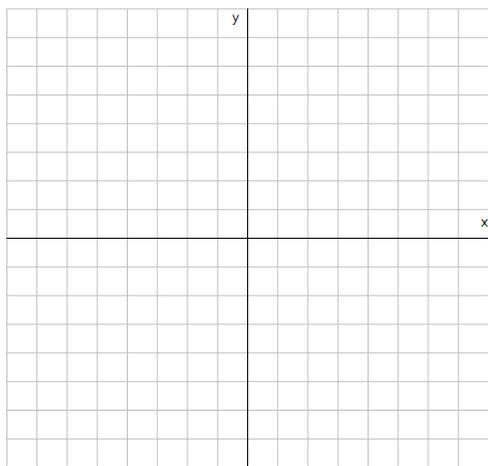


$$y = |x + 2|$$



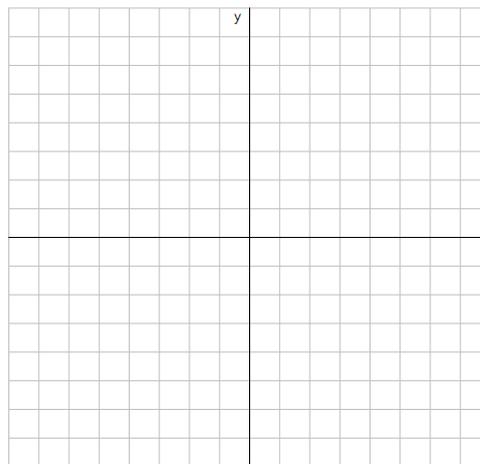
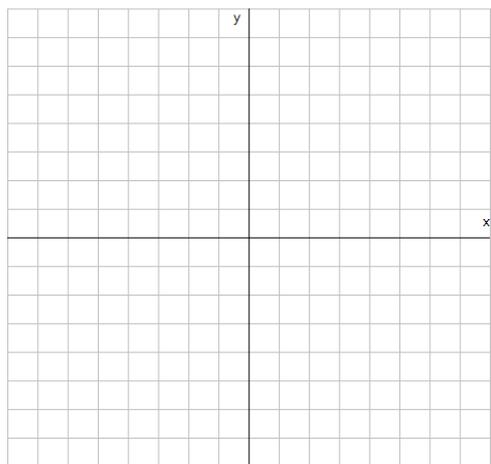
$$x^2 + y^2 - 2x - 2y = 2$$

$$\{(x, y) \mid y \geq 0\}$$



$$\{(x, y) \mid |x| < 3 \text{ and } |y| > 2\}$$

$$\{(x, y) \mid x^2 + y^2 \leq 1\}$$



Characteristics we can use to help us graph in addition to knowing special shapes or graphs:

Intercepts:

To find the x - intercept:

To find the y-intercept:

Symmetry Tests:

Symmetry with respect to the x-axis:

Replace y with -y and equation should be unchanged.

Symmetry with respect to the y-axis:

Replace x with -x and equation should be unchanged.

Symmetry with respect to the origin:

Replace x with -x and y with -y and equation should be unchanged.

Indicate intercepts and symmetry of the following:

$$y = x^3 - 6x$$

$$x = |y|$$

$$y = 9 - x^2$$

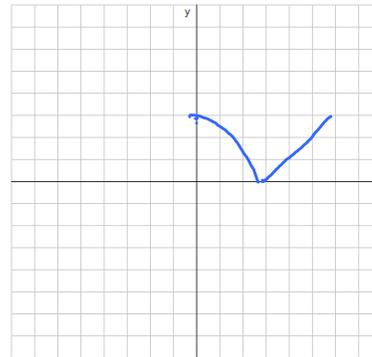
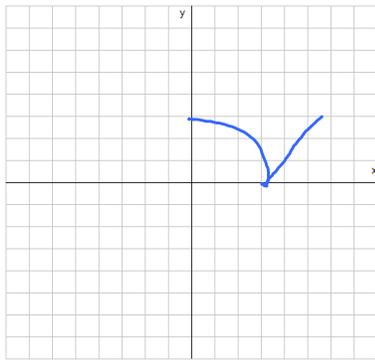
$$x^4 + x = y$$

$$x^4y^4 + xy = 1$$

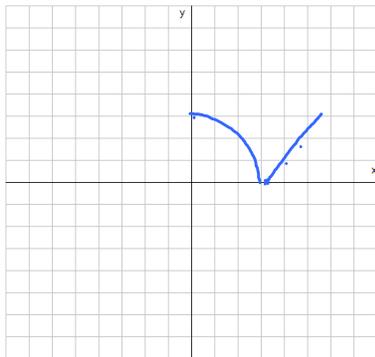
Given the following partial graph, complete the graph so that it is:

a) symmetric with respect to the x-axis

b) symmetric with respect to the y-axis



c) symmetric with respect to the origin



Find the equation of the circle with center at $(1, -4)$ and a radius of 8.

Find the equation of a circle having the endpoints of its diameter at $(-1, 5)$ and $(2, -3)$.