

**Graphing
Circles, Lines, Parabolas**

Graphing a Circle:

$$(x-h)^2 + (y-k)^2 = r^2$$

(h,k) is the Center

r is the radius.

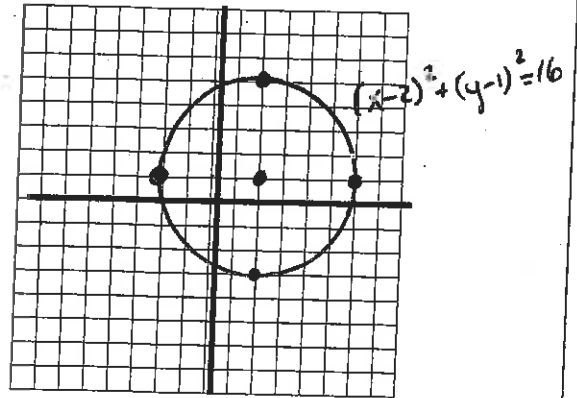
Example: $(x-2)^2 + (y-1)^2 = 16$

1. Find Center & Radius

Center = (2, 1)

$r = \sqrt{16} = 4$

2. Graph (use a Compass!)



Example: $(x+3)^2 + y^2 = 12$

Find the center and radius.

Center = (-3, 0)

radius = $\sqrt{12}$
 $= 2\sqrt{3}$

Example: center = (6, -2)

Radius = 5

Write the equation of the circle in standard form.

$$(x-6)^2 + (y-(-2))^2 = 5^2$$

$$(x-6)^2 + (y+2)^2 = 25$$

Graphing a Line:

Example: $-4x - 8y = 16$

1. Put in $y=mx+b$ form

$$\begin{aligned} -4x - 8y &= 16 \\ -8y &= 4x + 16 \\ y &= \frac{4}{-8}x + \frac{16}{-8} \end{aligned}$$

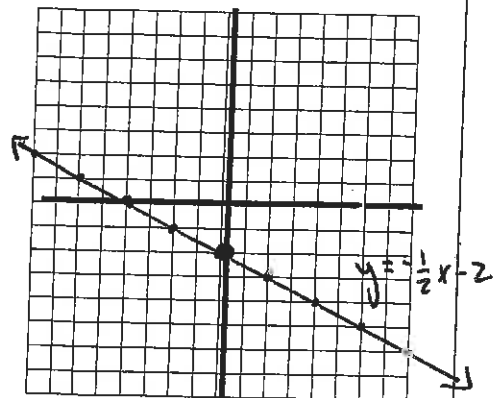
$$y = -\frac{1}{2}x - 2$$

2. Find slope & intercept

Slope = $-\frac{1}{2}$

y-intercept: $= -2$

3. Graph



Graphing a Parabola: $y = ax^2 + bx + c$
 leading coefficient \uparrow a \uparrow constant coefficient c

Example: $y = x^2 - 2x - 6$

1. Find the axis of symmetry	2. Make a Table	3. Graph																
$x = \frac{-b}{2a}$ $x = \frac{-(-2)}{2(1)}$ $x = \frac{2}{2}$ <div style="border: 1px solid black; display: inline-block; padding: 2px;">x = 1</div>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">x</th> <th style="width: 50%;">y</th> </tr> </thead> <tbody> <tr><td>-2</td><td>2</td></tr> <tr><td>-1</td><td>-3</td></tr> <tr><td>0</td><td>-6</td></tr> <tr><td>1</td><td>-7</td></tr> <tr><td>2</td><td>-6</td></tr> <tr><td>3</td><td>-3</td></tr> <tr><td>4</td><td>2</td></tr> </tbody> </table>	x	y	-2	2	-1	-3	0	-6	1	-7	2	-6	3	-3	4	2	
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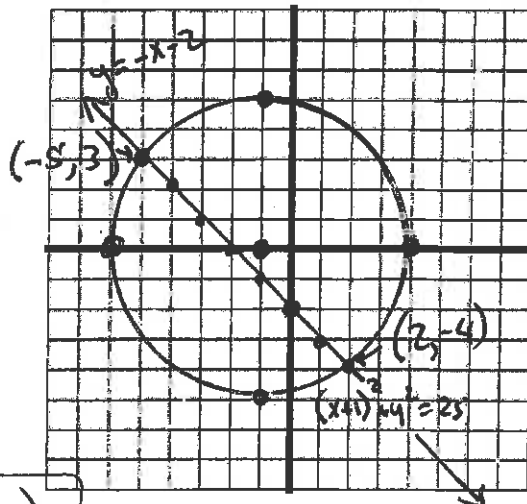
Example: $y = x^2 - 3x$

1. Find the axis of symmetry	2. Make a Table	3. Graph														
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Solving a system by graphing: (find where they intersect).
 Example: Solve by Graphing

Circle $\rightarrow 25 = (x+1)^2 + y^2$
 Line $\rightarrow y + x = -2$

$y = -x - 2$
 Slope = $-\frac{1}{1}$
 int = -2



Solution: (-5, 3), (2, -4)

Center = (-1, 0)
 $r = \sqrt{25} = 5$