7.3 Solving Systems by Graphing

Linear Equations	Quadratic Equations	Circle Equations
$y = mx + b$	$y = ax^2 + bx + c$	$(x-h)^2 + (y-k)^2 = r^2$
$m = $ slope $b = $ y-intercept	Vertex = $\left(\frac{-b}{2a}, \text{ plug it in} \right)$	$(h, k) = $ Center $r = $ Radius
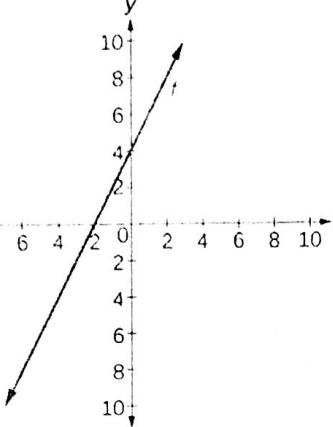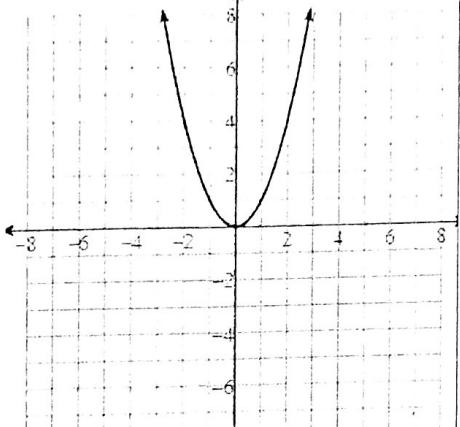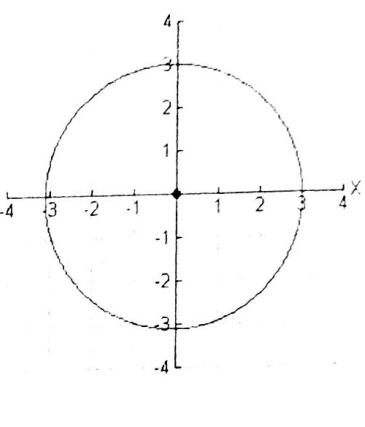
A system of equations is a set of equations with the same VARIABLE(S). The solution(s) to a system of equations are the **points of intersection** and are to be written as **ordered pairs**. A system of equations can have...

No real solutions	One real solution	Two real solutions	Infinite real solutions
No intersection	One intersection	Two intersections	Same graph
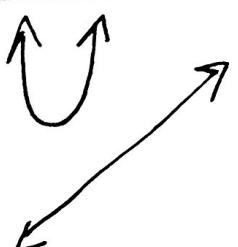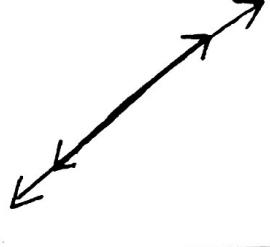
7.3 Examples
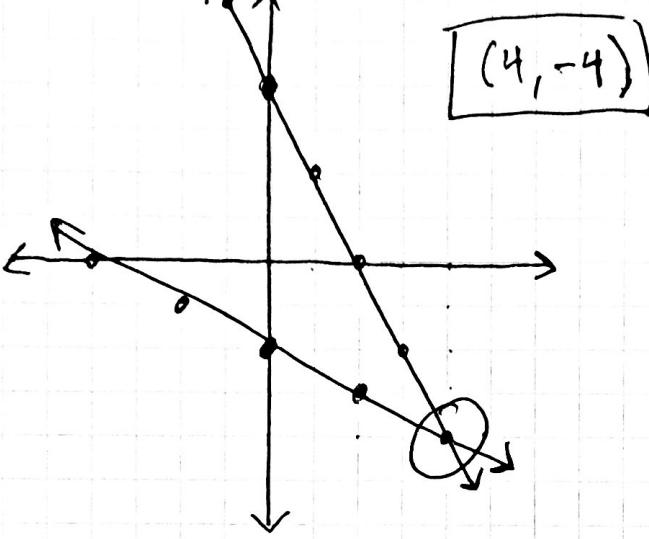
$\frac{-b}{2a} = \frac{-2}{2(1)} = \frac{-2}{2} = -1$ $y = (-1)^2 + 2(-1) - 2$
$= -3$

Vertex $(-1, -3)$

b] $y = -2x + 4$
$y = -\frac{1}{2}x - 2$

$(4, -4)$

c] $a = 1$ $b = 2$ $c = -2$
$y = x^2 + 2x - 2$
$y = 2x - 2$

$1a = 1(1) = 1$
$3a = 3(1) = 3$
$5a = 5(1) = 5$

$(0, -2)$
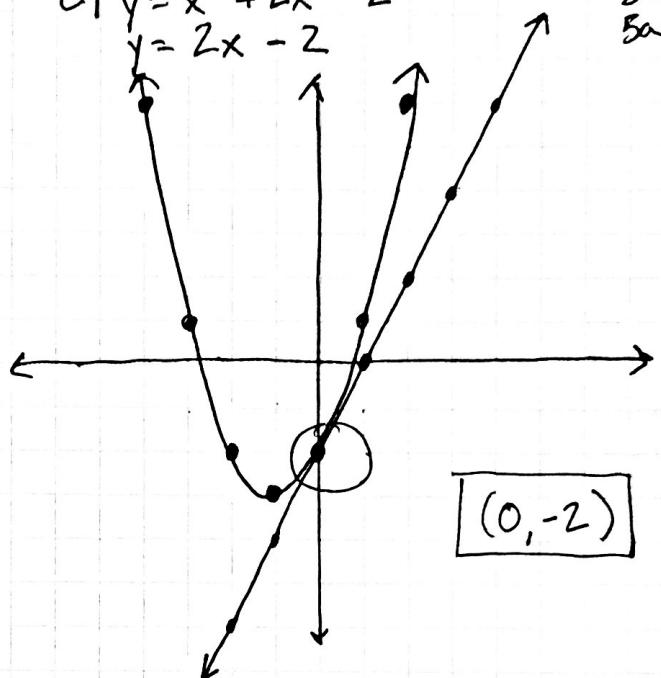
f] $y = x^2$ Vertex: $(0,0)$ $a = 1$
$y = -x^2 + 8 = -x^2 + 0x + 8$

$a = -1$ $b = 0$ $c = 8$
$\frac{-b}{2a} = \frac{0}{2(-1)} = 0$

$y = -(0)^2 + 0(0) + 8$
$= 8$
Vertex $(0, 8)$

$1a = -1$
$3a = -3$
$5a = -5$

$(2, 4),$
$(-2, 4)$
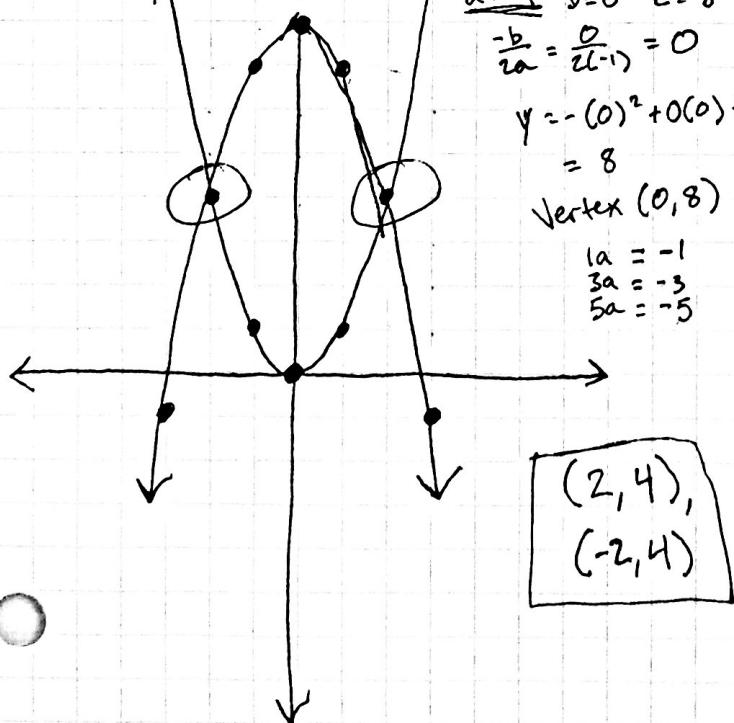
g] $y = 4 - x = -x + 4$
$x^2 + y^2 = 16$

Center: $(0, 0)$
$r = \sqrt{16} = 4$

$(0, 4)$
$(4, 0)$

Quadratics

5a

3a

1a

Vertex
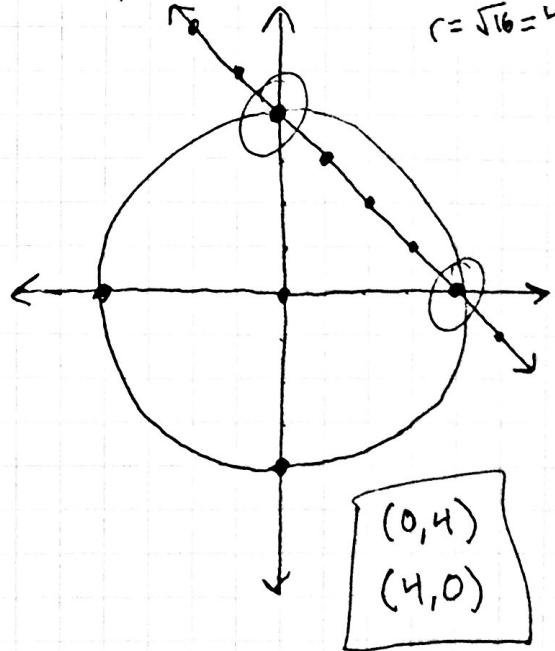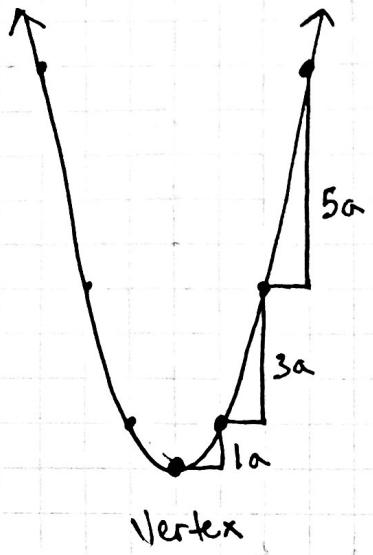
ex: $a = 2$

$1a = 1(2) = 2$

$3a = 3(2) = 6$

$5a = 5(2) = 10$

6

2
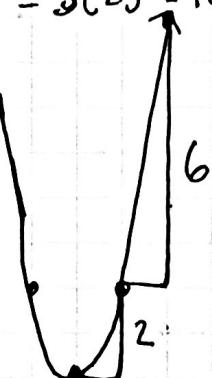
Line: x
Parabola: x^2
Circle: $x^2 + y^2$