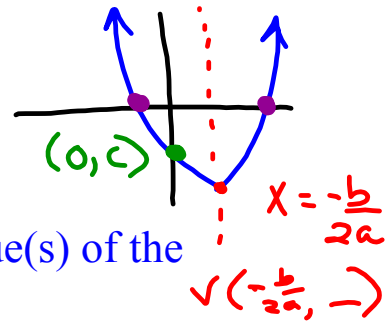


4-2 Solving Quadratic Equations by Graphing

- interpret solutions given graphs of quadratics
- find solutions to quadratics by graphing



To "solve an equation" means to find the value(s) of the variable that makes the equation true.

- this is also how you find the **x-intercept(s)** of the graph.
- x-intercepts are also known as **solutions, zeros, or roots.**

confused???



Key Concept	Solutions of a Quadratic Equation		
<ul style="list-style-type: none"> • Words A quadratic equation can have one real solution, two real solutions, or no real solution. 			
<ul style="list-style-type: none"> • Models 	<p>One Real Solution</p> <p>$\{-2\}$</p>	<p>Two Real Solutions</p> <p>$\{2, -2\}$</p>	<p>No Real Solution</p> <p>$\{\emptyset\}$</p>

To Solve by Graphing

- graph the related function $f(x) = ax^2 + bx + c$.
- identify the zeros of the graph, if any.
- check your solutions with original equation $ax^2 + bx + c = 0$.

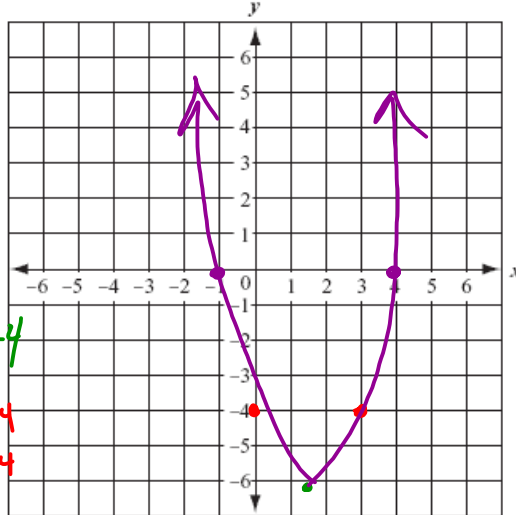
Examples: Solve each quadratic equation by graphing.

1. $x^2 - 3x - 4 = 0$

$y = x^2 - 3x - 4$

y-int: $(0, -4)$

X	Y
$(-1, 0)$	
$(0, -4)$	
$(1.5, -6.25)$	
$(3, -4)$	
$(4, 0)$	



$x = \frac{-b}{2a}$

$x = \frac{3}{2(1)}$

$x = 1.5$

$y = (\frac{3}{2})^2 - 3(\frac{3}{2}) - 4$

$y = \frac{9}{4} - \frac{9 \cdot 2}{2 \cdot 2} - 4$

$y = \frac{9}{4} - \frac{18}{4} - \frac{16}{4}$

$y = -\frac{25}{4}$

$y = -6.25$

$y = (4)^2 - 3(4) - 4 \quad \{ -1, 4 \}$
 $y = 16 - 12 - 4$
 $y = 0$

Examples: Solve each quadratic equation by graphing.

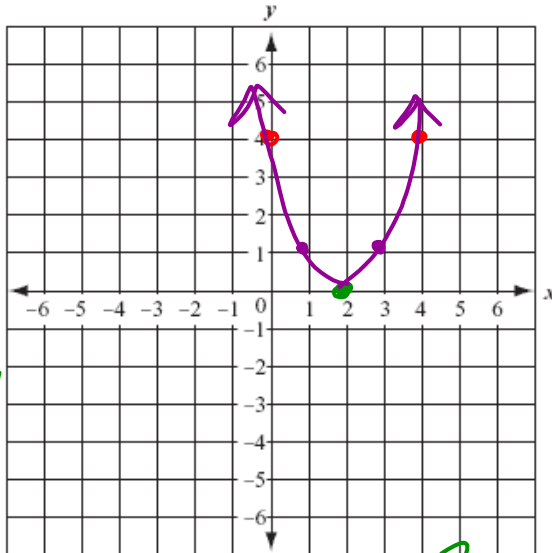
2. $x^2 - 4x = -4$

$x^2 - 4x + 4 = 0$

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

y-int: $(0, 4)$

X	Y
$(0, 4)$	
$(1, 1)$	
$(2, 0)$	
$(3, 1)$	
$(4, 4)$	



$x = \frac{-b}{2a}$

$x = \frac{4}{2(1)}$

$x = 2$

$y = (2)^2 - 4(2) + 4$

$y = 4 - 8 + 4$

$y = 0$

$y = (1)^2 - 4(1) + 4$
 $1 - 4 + 4$

$y = 1$

$\{ 2 \}$

Examples: Solve each quadratic equation by graphing. $\{\emptyset\}$

3. $-2x^2 - 4x - 5 = 0$
 $y = -2x^2 - 4x - 5$

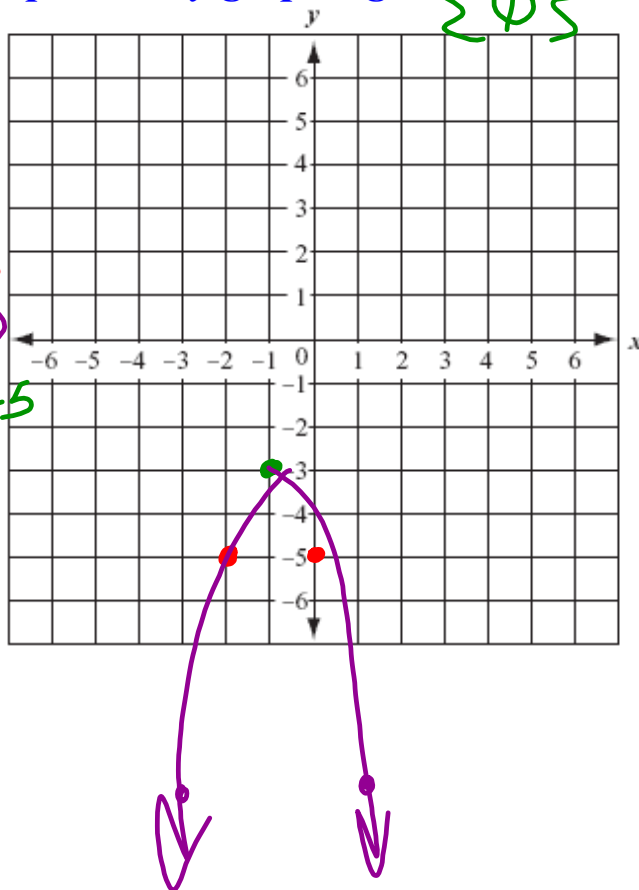
y -int $(0, -5)$

$x = \frac{-b}{2a}$ $y = -2(-1)^2 - 4(-1) - 5$

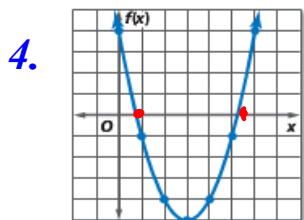
$x = \frac{4}{2(-2)}$

$x = \frac{4}{-4}$ $x = -1$

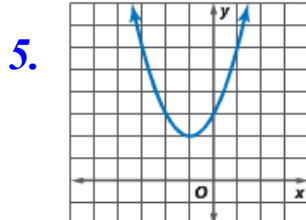
X	Y
$(-3, -11)$	
$(-2, -5)$	
$(-1, -3)$	
$(0, -5)$	
$(1, -11)$	



Determine the solutions.



0-1 5-6
 between 0 and 1
 between 5 and 6



$\{\emptyset\}$

6.

x	0	1	2	3	4	5	6
f(x)	4	-1	-4	-5	-4	-1	4

\uparrow \downarrow \downarrow \downarrow \downarrow \downarrow \downarrow \uparrow
 $+$ $-$ $-$ $-$ $-$ $-$ $-$ $+$

4-2 Worksheet



Attachments

6-1 HW.notebook