Algebra 1 9.2

Solve quadratic equations by graphing

Estimate quadratic solutions by graphing

integer

Solution

Root

x-intercept

Double root

standard form

equation

related function

Whiteboards

x-intercept

integer – whole no. + opp

Solution, Root, x-intercept } x-axis

standard form $0 = x^2 + 6x + 9$

equation $= 0$

related function $y =$

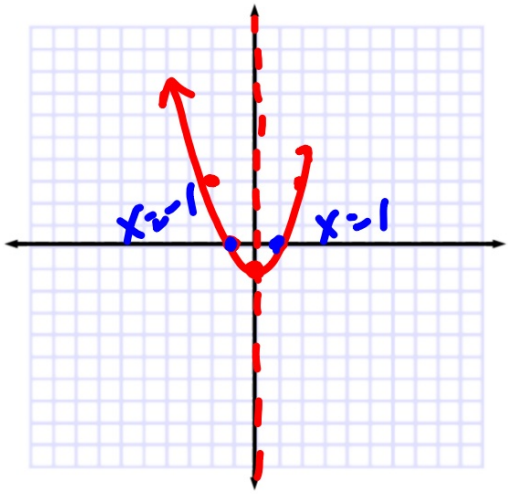
Where does the graph cross the x-axis?
What is true about the y-coordinate there?

$y = x^2 - 1$

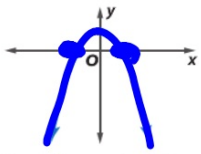
A.O.S. $x = \frac{-b}{2a} = \frac{0}{2} = 0$

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

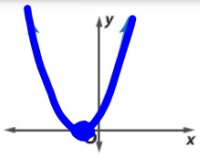
X-int.



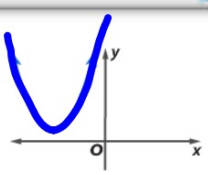
KeyConcept Solutions of Quadratic Equations



two unique real solutions



one unique real solution



no real solutions

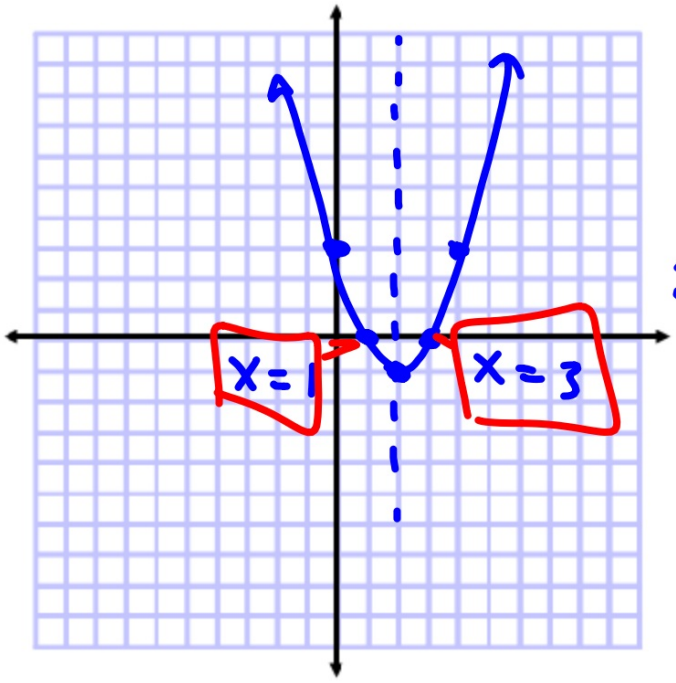
"double root"

GuidedPractice **Solve each equation by graphing.**

1B $x^2 - 4x + 3 = 0$

$y = 1x^2 - 4x + 3$

$x = \frac{4}{2} = 2$



Does it open up or down?
Function form (y=)
x=-b/2a etc. A.O.S. $x = 2$
Table of values

Answer the question
Solve: where does it cross x-axis?
hint: y-coordinate there is 0

	$x^2 - 4x + 3$	
2	$4 - 8 + 3$	-1
3	$9 - 12 + 3$	0

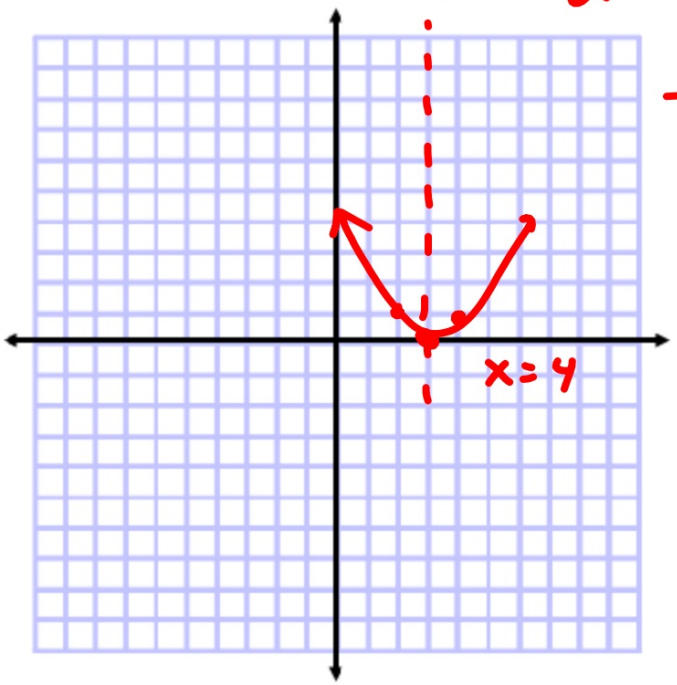
$y = 1x^2 - 6x + 9$

Example 2 Double Root

Solve $x^2 - 6x = -9$ by graphing.

$+9 \quad +9$

$x = \frac{6}{2} = 3$



	x^2-6x+9	
3	$9-18+9$	0
4	$16-24+9$	1

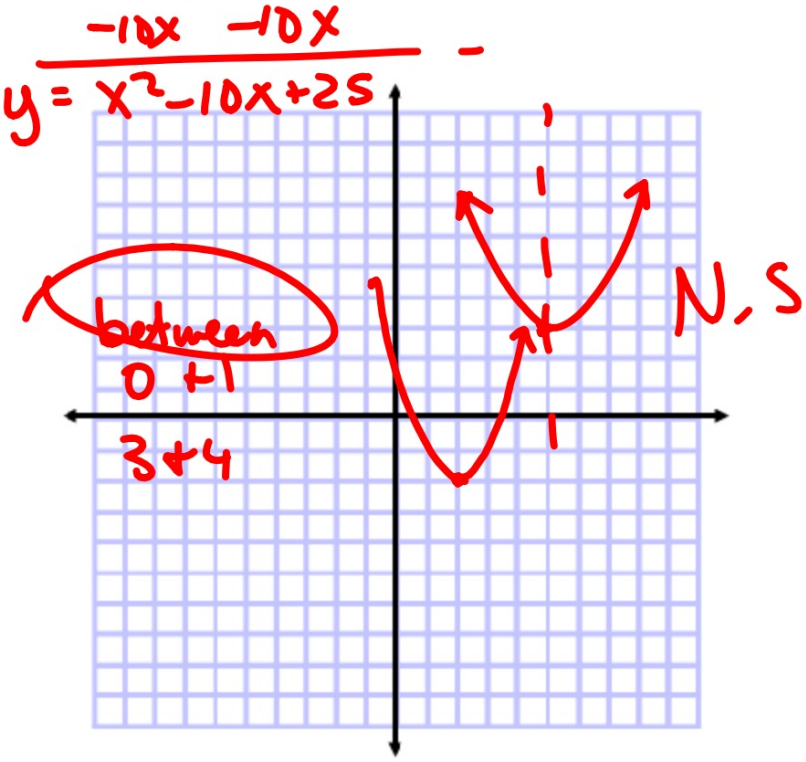
Change to =0 (if necessary)
Open up or down?
Use function form (y=) for graphing
Answer the question
If your graph is inaccurate...

GuidedPractice

Solve each equation by graphing.

2A. $x^2 + 25 = 10x$

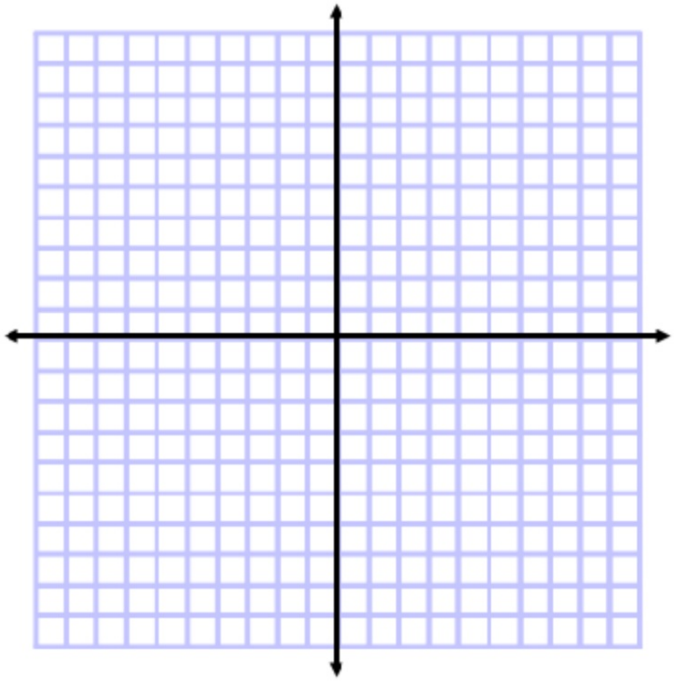
2B. $x^2 = -8x - 16$



Rearrange
(if necessary)
Change to function form

Example 3 No Real Roots

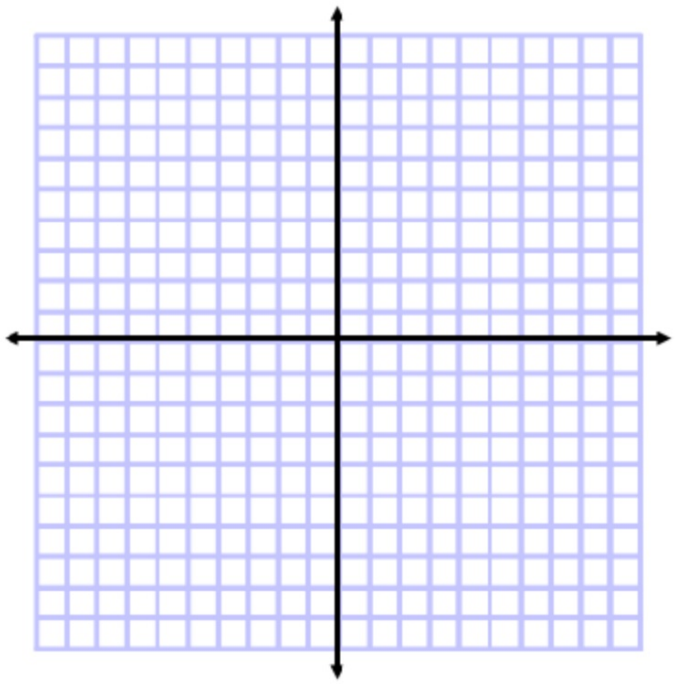
Solve $2x^2 - 3x + 5 = 0$ by graphing.



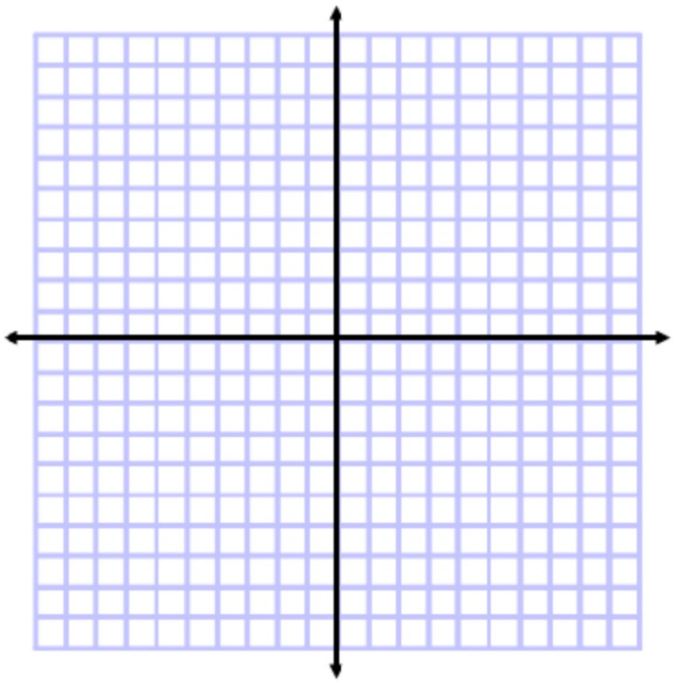
complex number

Solve each equation by graphing.

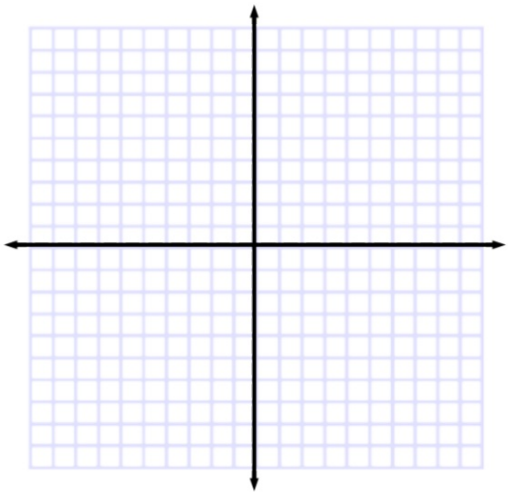
3A. $-x^2 - 3x = 5$



3B. $-2x^2 - 8 = 6x$



What if the answer isn't an integer?
What is it between? (Instead of estimating...)
$y = x^2 + 3x - 1$

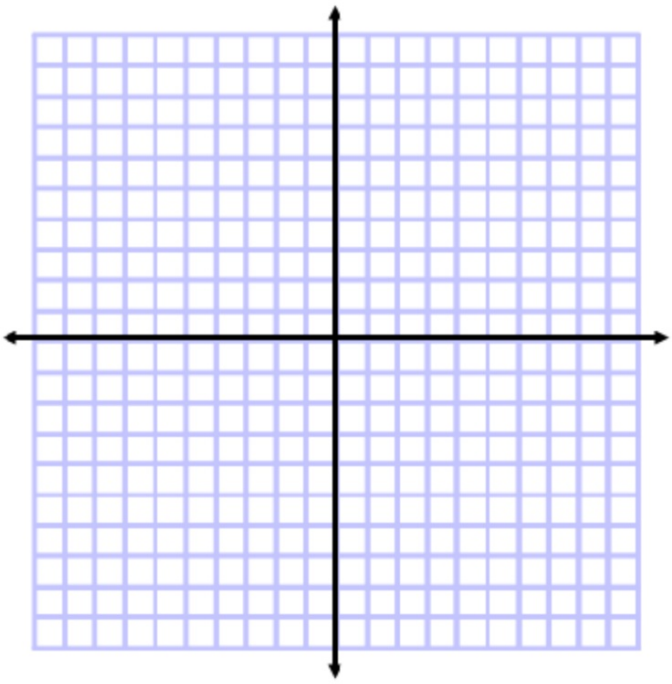


Example 4 Approximate Roots with a Table

Solve $x^2 + 6x + 6 = 0$ by graphing. If integral roots cannot be found, estimate the roots to the nearest tenth.

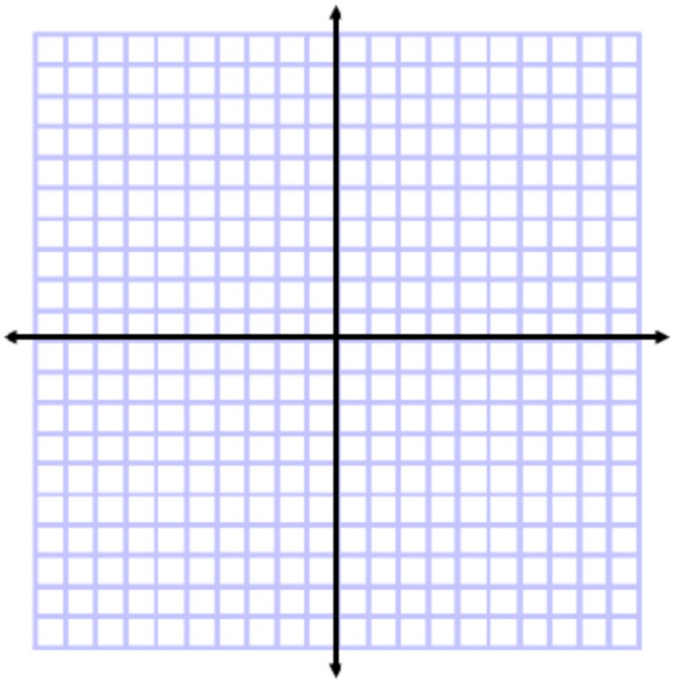
between

if not integers...
what is it between?
vs
nearest tenth?



GuidedPractice

4. Solve $2x^2 + 6x - 3 = 0$ by graphing. If integral roots cannot be found, ~~estimate the roots to the nearest tenth~~.



What is it between?

vs

nearest tenth?

9.2 p558

1-23 odd