

Jan. 25, 2017

Sect. 3-3

Solving Quad. Eqns. & Ineqs.

Solving Eqns.

Types of Solns.

Given answers, find eqn.

Solve Ineqs.

Alg.

Graphic

Solve:

$$x^2 = 9$$

$$\sqrt{x^2} = \pm \sqrt{9}$$

$$x = \pm 3$$

$$\{\pm 3\}$$

$$\frac{2x^2}{2} = \frac{-32}{2}$$

$$\sqrt{x^2} = \pm \sqrt{-16}$$

$$x = \pm 4i$$

$$\{\pm 4i\}$$

$$x^2 + 5x + 6 = 0$$

$$(x+2)(x+3) = 0$$

$$x+2=0 \quad x+3=0$$

$$x=-2 \quad x=-3$$

$$\{-3, -2\}$$

$$3x^2 + 7x - 1 = 0$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-7 \pm \sqrt{7^2 - 4(3)(-1)}}{2(3)}$$

$$= \frac{-7 \pm \sqrt{49 + 12}}{6}$$

$$= \frac{-7 \pm \sqrt{61}}{6}$$

Doesn't Factor

Complete the Square
(but why?)

Quad. Formula

Types of Solutions

The Discriminant

$$b^2 - 4ac > 0 \Rightarrow 2 \text{ real solns.}$$

$$b^2 - 4ac = 0 \Rightarrow 1 \text{ (double) real soln.}$$

$$b^2 - 4ac < 0 \Rightarrow 2 \text{ complex solns.}$$

If $b^2 - 4ac$ is a perfect square, the original problem can be factored.

$$\text{Solve: } (x+3)(x-2) > 0$$

$$x+3=0 \quad x-2=0$$

$$x=-3 \quad x=2$$



$$(-\infty, -3) \cup (2, \infty)$$

$$x^2 + 2x - 15 \leq 0$$

$$(x + 5)(x - 3) \leq 0$$

-5 3



$$[-5, 3]$$

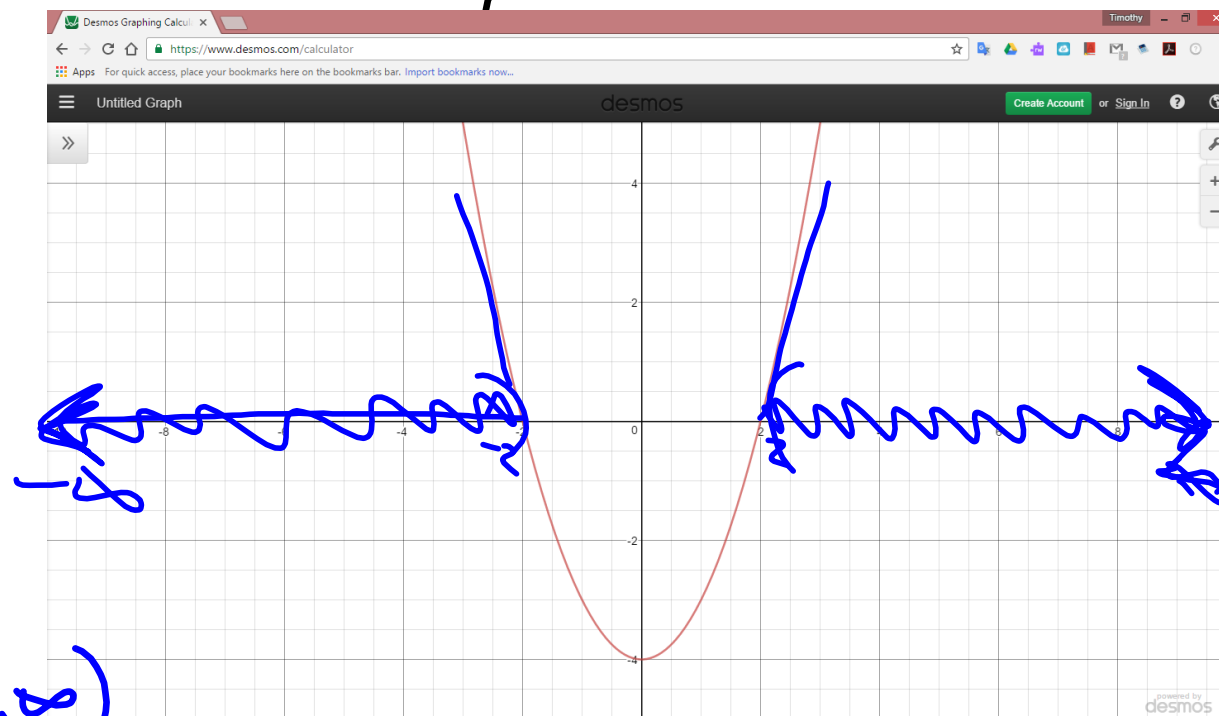
Graphically

Solve:

$$f(x) > 0$$

Where is
graph above
x-axis?

$$(-\infty, -2) \cup (2, \infty)$$



$$f(x) > 0$$

$$(-\infty, \infty)$$

$$f(x) < 0$$

No Sol.

