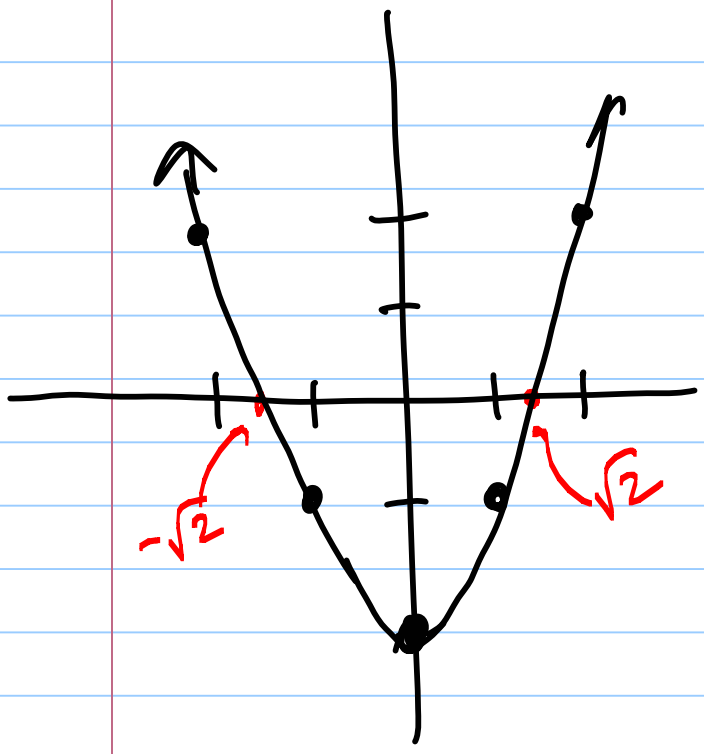
Section: Quadratic Inequalities & other Equations.

Note Title 6/30/2009



x	$f(x) = x^2 - 2$
-2	2
-1	-1
0	-2
1	-1
2	2

Solve $x^2 - 2 = 0$

(here, you provide values of x that make the equation true)

With inequalities, lets observe what happens. Solve $x^2 - 2 < 0$

Solution: $-\sqrt{2} < x < \sqrt{2}$

Ex] Solve: $x^2 - 6x < 2x - 12$

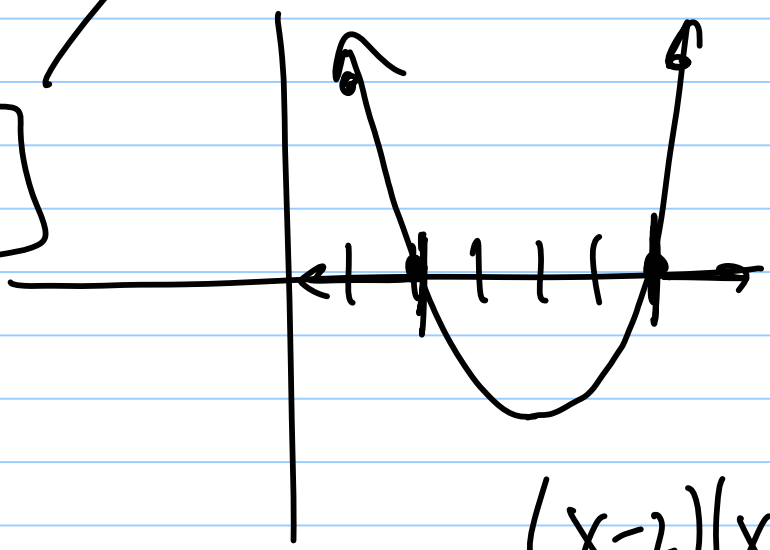
Collect all terms on one side.

$x^2 - 8x + 12 < 0$

$(x - 2)(x - 6) < 0$

Solution

$2 < x < 6$



$(x-2)(x-6) > 0$?

$x < 2$ or $x > 6$

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(in millions)

$$y = -.084x^2 + 1.124x + 4.028$$

x = # of yrs after 1986.

at least 5,940,000 kg?

$$-.084x^2 + 1.124x + 4.028 \geq 5.94$$

$$-.084x^2 + 1.124x - 1.912 \geq 0$$

a) Use Quad. Formula to get zeros

b) Graph parabola (open down)

c) Decide on what x-interval works.

* Between 1986 and 1990, which years??

Other Equations:

1) Equations with Square Roots

(remember to check answers)

$$x-2=\sqrt{7x-6}$$

Isolate Radical quantity

Square both sides

$$(x-2)^2 = 7x-6$$

$$x^2-4x+4 = 7x-6$$

$$x^2-11x+10=0$$

$$(x-10)(x-1)=0$$

$x=10$ or $x=1$

Check.

$x-2=\sqrt{7x-6}$

Check $x=1$: $1-2=-1$

$\sqrt{7-6}=1$ (positive only)

$x=1$ doesn't work.

$x = 10$ works

Absolute Value Equations: (Solve & check!!)

Solve: $|-3x+5| = |2x-6$

2 CASES:

$-3x+5 = |2x-6$ or $-3x+5 = -(|2x-6)$

$-15x = -11$

$x = \frac{11}{15}$

or

$-3x+5 = -12x+6$

$9x = 1$

$x = \frac{1}{9}$

Checks: $x = \frac{1}{9}$ does not work.

$x = \frac{11}{15}$ works

③ Absolute Value and Inequalities

(a) $|5x+6| \leq 5$

$$-5 \leq 5x+6 \leq 5$$ Double inequality

Answer: $\frac{-11}{5} \leq x \leq -\frac{1}{5}$

(b) $|4x-4| > 4$

$4x-4 > 4$ or $4x-4 < -4$

$4x > 8$ or $4x < 0$

$x > 2$ or $x < 0$

WORK PART A:

$$-5 < 5x+6 < 5$$

$-5 < 5x+6$ and $5x+6 < 5$

$-11 < 5x$

$5x < -1$

and

$\frac{-11}{5} < x$

$x < -\frac{1}{5}$

$$\boxed{-\frac{11}{5} < x < -\frac{1}{5}}$$