Jan. 18, 2017

Sect. 2-4

Absolute Value Eqns & Ineqs

Eqn. { Set up
Solve
Check

Ineq. { Write as Comp. Ineq. (AND/OR)
Solve
Graph

Solve: $|x| = 4$

$x = 4$ or $x = -4$

$\{-4, 4\}$ $\{\pm 4\}$

$|x - 1| = 7$

$x - 1 = 7$ or $x - 1 = -7$

$x = 8$ or $x = -6$

$\{-6, 8\}$

$|x-2|+3=7$

$-3 \quad -3$

$|x-2|=4$

$x-2=4$ or $x-2=-4$

$x=6$ or $x=-2$

$\{-2,6\}$

$\frac{2|x-1|}{2}=\frac{-6}{2}$

$|x-1|=3$

$x-1=3$ or $x-1=-3$

$x=4$ or $x=-2$

$\{-2,4\}$

Ineqs.

Rule: $|\text{stuff}| > \geq$ Set up as OR

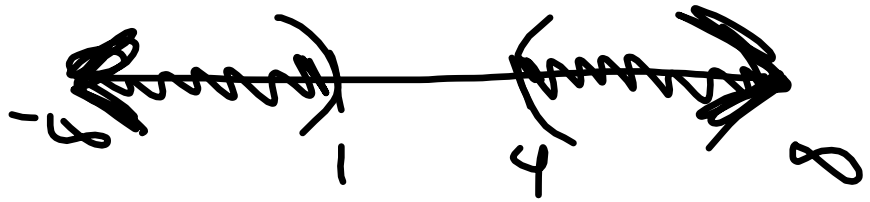
$|\text{stuff}| < \leq$ Set up as double AND

$|2x-5| > 3$ OR

$2x-5 > 3$ OR $2x-5 < -3$

$2x > 8$ $2x < 2$

$x > 4$ OR $x < 1$



$(-\infty, 1) \cup (4, \infty)$

$|3x+2| \leq 5$ AND

$-5 \leq 3x+2 \leq 5$

$-2 \quad -2 \quad -2$

$-7 \leq 3x \leq 3$

$\frac{-7}{3} \leq \frac{3x}{3} \leq \frac{3}{3}$

$-\frac{7}{3} \leq x \leq 1$

$\left[-\frac{7}{3}, 1\right]$

Be Careful

$|x+5| = -3$

~~$x+5 = -3$ or $x+5 = 3$~~

Wrong

No Sol.

$$\frac{-2|x-1|}{-2} = \frac{-6}{-2}$$

$$|x-1| = 3$$

Finish...

$|x-1| < -3$

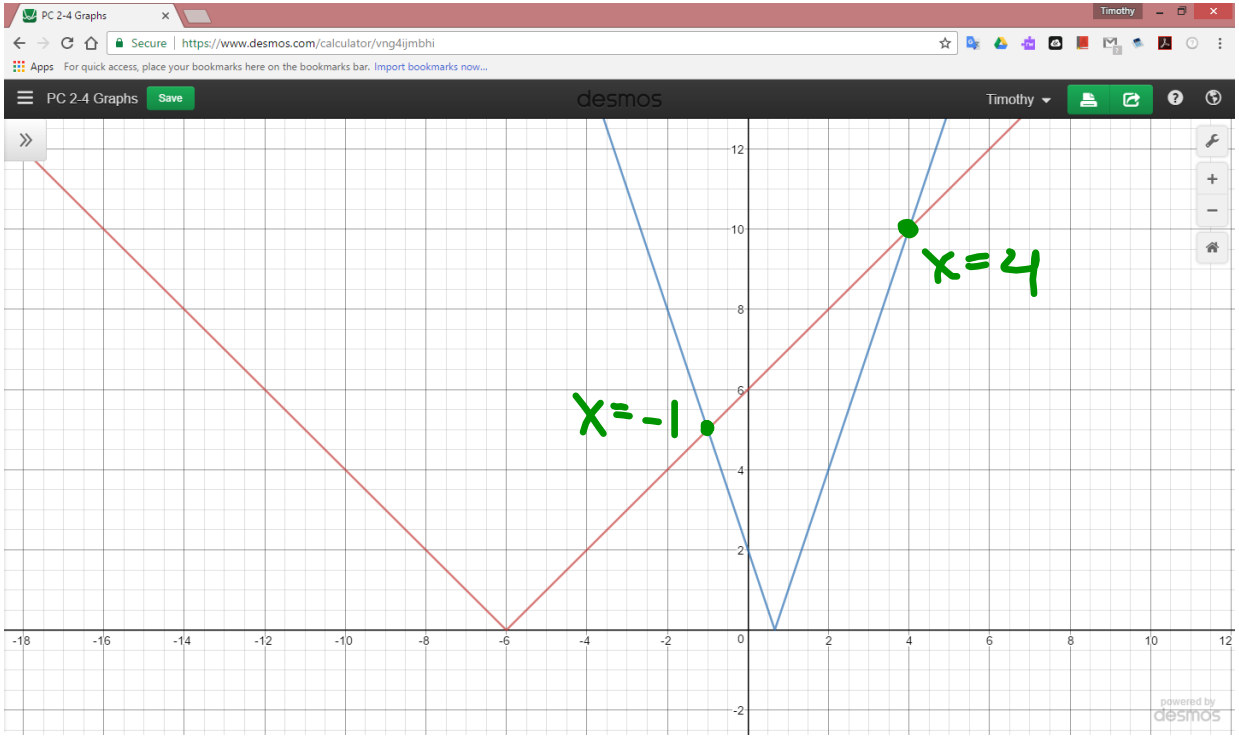
No Sol

$|x-1| > -3$

All real #s

$(-\infty, \infty)$

$$|x+6| = |3x-2|$$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x=4
x=-1
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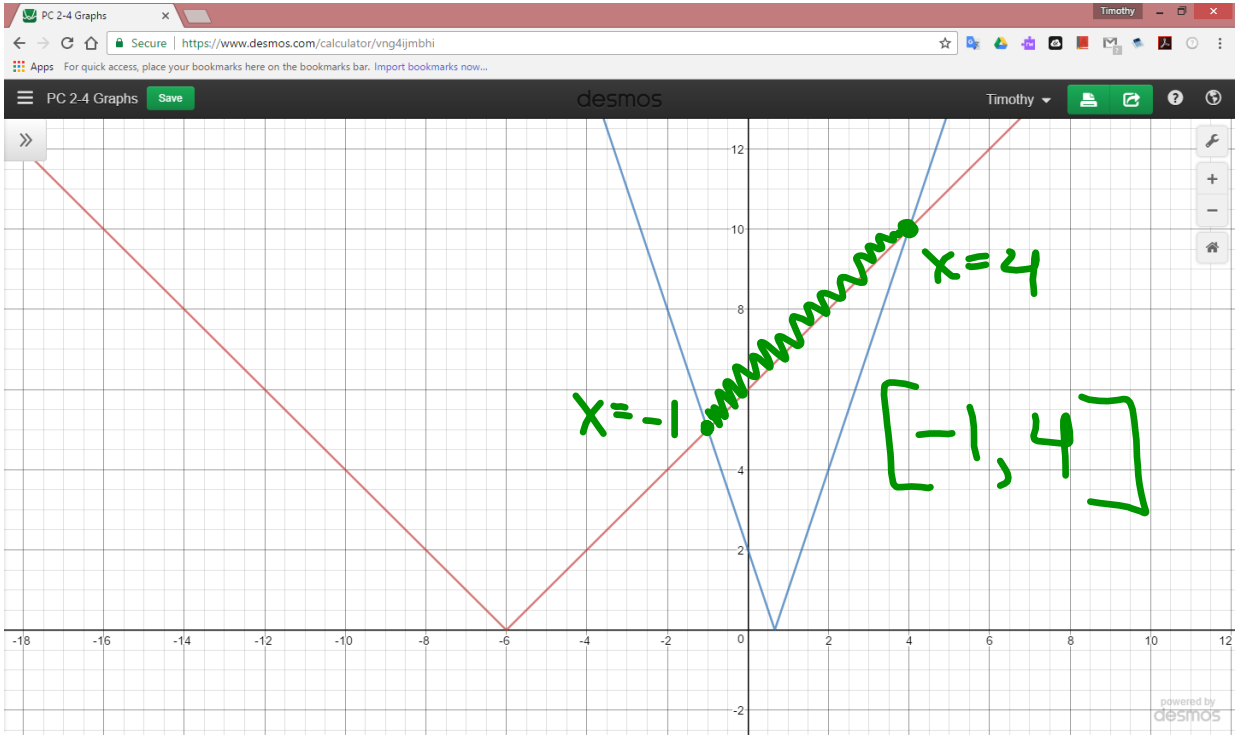
$$|x+6| \geq |3x-2|$$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Save
desmos
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x=4
x=-1
[-1, 4]
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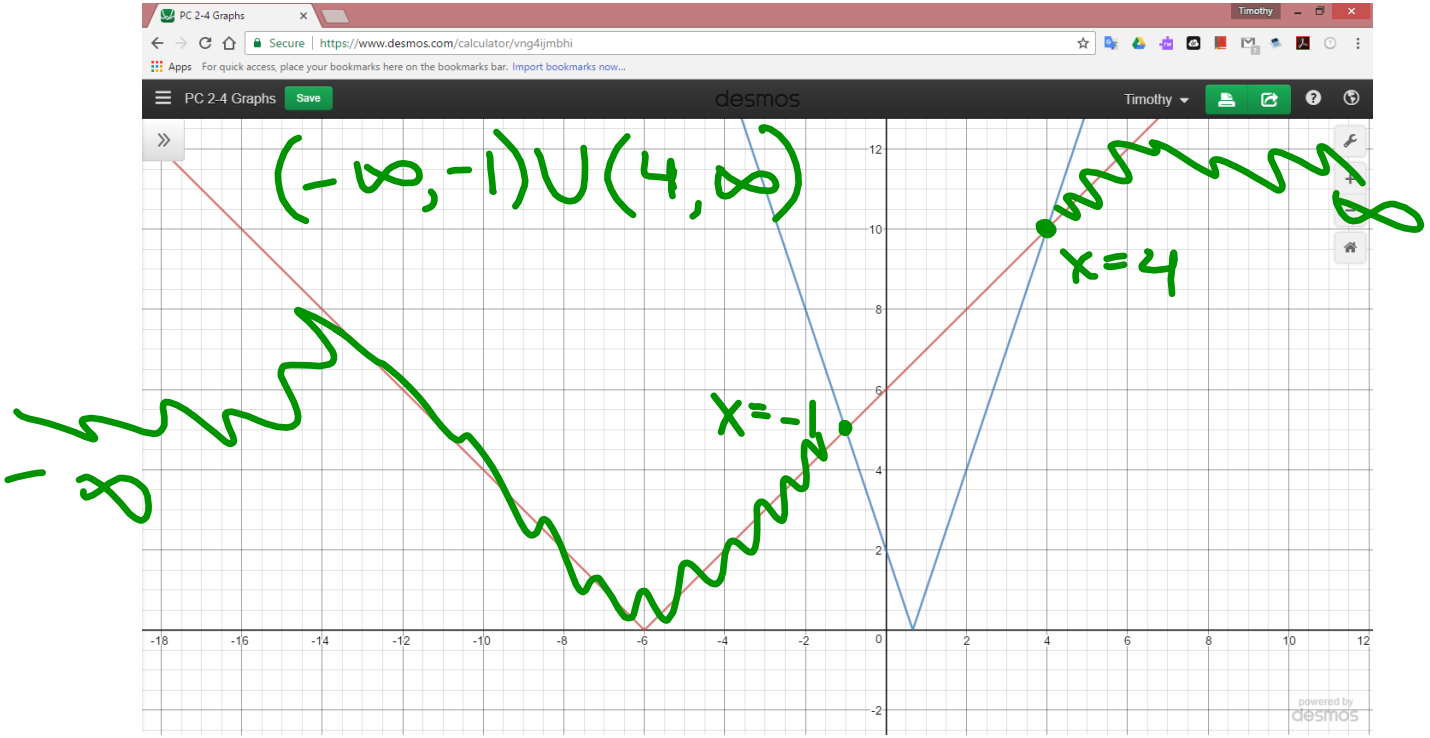
$$|x+6| < |3x-2|$$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