Solve in 3 ways

1. Factoring
2. Completing the Square
3. Quadratic Formula

$x^2-6x+8=0$

Use synthetic division to find $P(3)$ if $P(x)=x^2+6x-8$

$(a-b)^2=a^2-2ab+b^2$

1. Factors $+8$ whose sum is -6

$x^2-4x-2x+8=$

$x(x-4)-2(x-4)=$

$(x-4)(x-2)=0$

$x\in\{2,4\}$

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

$\frac{-6}{2}=-3 \rightarrow (-3)^2=+9$

$x^2-6x+3^2=-8+9$

$(x-3)^2=1$

$x-3=\pm\sqrt{1}=\pm 1$

$x=3\pm 1$

$3+1=4$ $\quad 3-1=2$

$x\in\{2,4\}$

$(x-3)^2=x^2-6x+9$

$(x+5)^2=x^2+10x+25$

$(x-7)^2=x^2-14x+49$

$2\cdot 7\cdot x$

$x^2 - 6x + 8 = 0$

$a = 1, b = -6, c = 8$

$b^2 - 4ac = (-6)^2 - 4(1)(8)$

$= 36 - 32 = 4$

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

$$\frac{-(-6) \pm \sqrt{4}}{2(1)} = \frac{6 \pm 2}{2}$$

$\frac{6+2}{2} = \frac{8}{2} = 4$

$\frac{6-2}{2} = \frac{4}{2} = 2$

$x \in \{2, 4\}$

Test 1

$|3x-7| = -5$

Nevah

$|3x-7| = +5$

$3x-7=5$ OR $3x-7=-5$

:

$|3x-7| < 5$

$3x-7<5$ AND $3x-7>-5$

$-5<3x-7<5$ is permitted

$|3x-7| > 5$

$3x-7>5$ OR $3x-7<-5$

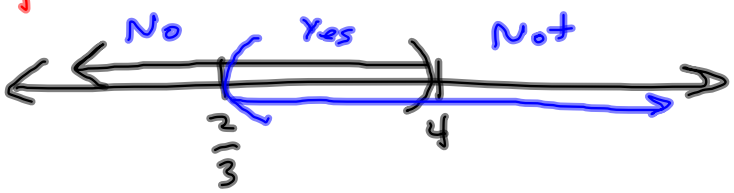
$-5>3x-7>5$ will get you shot.

$|3x-7| < 5$

$3x-7 < 5$ AND $3x-7 > -5$

$3x < 12$ $\quad 3x > 2$

$\{x \mid x < 4$ AND $x > \frac{2}{3}\}$ set-builder



$\{x \mid x < 4 \text{ and } x > \frac{2}{3}\}$

$= (\frac{2}{3}, 4)$ Interval answer.

$|3x-7| > 5$

$3x-7 > 5$ OR $3x-7 < -5$

$3x > 12$

$x > 4$

$3x-7 > -5$ → most common screwup.

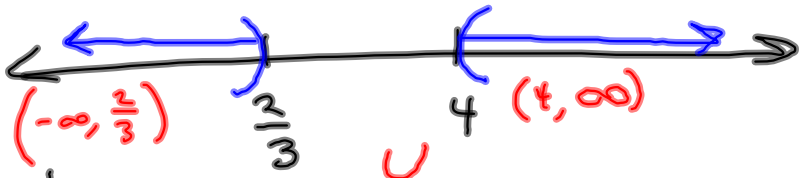
$3x-7 < -5$

$3x < 2$

$x < \frac{2}{3}$

$\{x \mid x > 4 \text{ OR } x < \frac{2}{3}\}$

Gahbidge $(\frac{2}{3}, -\infty)$



Strict inequality.

$(-\infty, \frac{2}{3}) \cup (4, \infty)$ OR $(4, \infty)$

$|5x-7| \geq 5 \Rightarrow x \in (-\infty, \frac{2}{3}] \cup [4, \infty)$

$5x-3y=10$ Graph

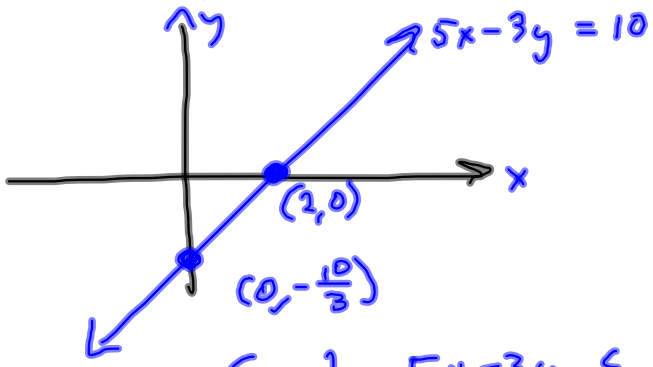
x	y
0	$-\frac{10}{3}$
2	0

$5(0)-3y=10 \Rightarrow y=-\frac{10}{3}$

$5x-3(0)=10 \Rightarrow x=\frac{10}{5}=2$

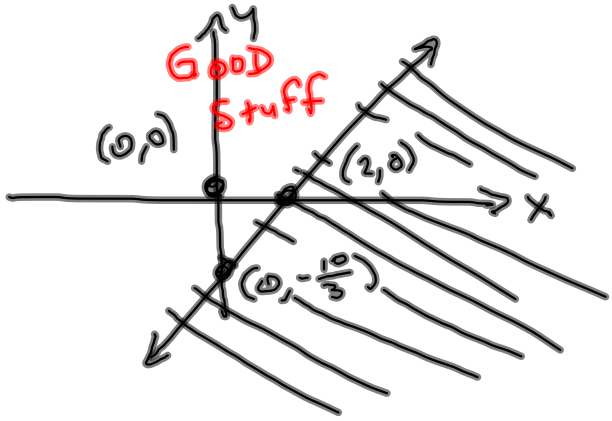
$(0,-\frac{10}{3})$ y-int $(x=0)$

$(2,0)$ x-int $(y=0)$



$\{\frac{2}{3}, 4\}$

Graph $5x-3y \leq 10$



Test (0,0):

$5(0)-3(0) \leq 10$?

$0 \leq 10$?

yes. (0,0) good

Scratch out bad stuff