

$$\checkmark x^2 + 8x - 12 = 0$$

$$\checkmark x^2 + 8x + 4^2 = 12 + 16$$

$$\frac{8}{2} = 4 \rightsquigarrow 4^2 = 16$$

///  
2, 7, 5, 7, 11, 13, 17, 19, 23,  
29, 31

$$\checkmark (x+4)^2 = 28$$

$$\left\{ \begin{array}{l} \sqrt{(x+4)^2} = \sqrt{28} \\ |x+4| = \sqrt{28} \end{array} \right\} \text{optional steps}$$

$$\checkmark x+4 = \pm \sqrt{28}$$

$$x+4 = \pm 2\sqrt{7}$$

$$x = -4 \pm 2\sqrt{7}$$

$$2 \overline{) 28}$$

$$2 \overline{) 14}$$

$$7$$

$$\sqrt{2 \cdot 2 \cdot 7} = 2\sqrt{7}$$

$$3x^2 - 2x - 11 = 0$$

$$x^2 - \frac{2}{3}x - \frac{11}{3} = 0$$

$$x^2 - \frac{2}{3}x = \frac{11}{3}$$

$$2 \overline{) 34} \\ \underline{17}$$

$$\frac{\frac{2}{3}}{2} = \frac{2}{3} \cdot \frac{1}{2} = \frac{1}{3}$$

$$\left(\frac{1}{3}\right)^2 = \frac{1^2}{3^2} = \frac{1}{9}$$

$$x^2 - \frac{2}{3}x + \left(\frac{1}{3}\right)^2 = \frac{11}{3} + \frac{1}{9} = \frac{11}{3} \cdot \frac{3}{3} + \frac{1}{9} = \frac{34}{9}$$

$$\left(x - \frac{1}{3}\right)^2 = \frac{34}{9}$$

$$x - \frac{1}{3} = \pm \sqrt{\frac{34}{9}} = \pm \frac{\sqrt{34}}{\sqrt{9}} = \pm \frac{\sqrt{34}}{3}$$

$$x = \frac{1}{3} \pm \frac{\sqrt{34}}{3}$$

$$|3x+5| < 7$$

$$|A| < B$$

$$A < B \text{ AND } A > -B$$

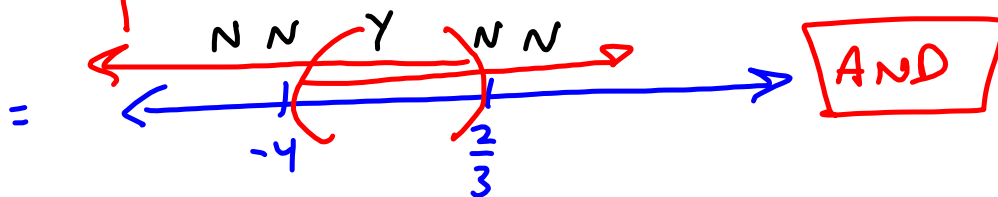
$$3x+5 < 7 \quad \text{AND}$$

$$3x+5 > -7$$

$$3x < 2$$

$$3x > -12$$

$$\left\{ x \mid x < \frac{2}{3} \quad \text{AND} \quad x > -\frac{12}{3} = -4 \right\}$$



=

$$\boxed{\left(-4, \frac{2}{3}\right)}$$

$$|3x+5| > 7$$

$$|A| > B$$

$$A > B \text{ OR } A < -B$$

$$3x+5 > 7 \text{ OR } 3x+5 < -7$$

$$3x > 2$$

$$3x < -12$$

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

Set-builder



OR

$$\rightarrow = \boxed{(-\infty, -4) \cup (\frac{2}{3}, \infty)}$$

Interval

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

$= \emptyset$

$$\{x \mid x < \frac{2}{3} \text{ OR } x > -\frac{12}{3} = -4\}$$

$= (-\infty, \infty)$

$$|2x+5| > -3$$

$$(-\infty, \infty) \text{ Always}$$

$$|2x+5| < -3$$

$$\emptyset \text{ Never!}$$

$$589x^2 - 1309x + 726 = 0$$

$$a = 589, b = -1309, c = 726$$

$$b^2 - 4ac = (-1309)^2 - 4(589)(726)$$

$$= 3025$$

$$\sqrt{3025} = 55$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{1309 \pm 55}{2(589)}$$

$$19 \overline{) 589}$$

$$31$$

$$\rightarrow \frac{22}{19} = x$$

$$\rightarrow \frac{33}{31} = x$$

$$589 \left(x - \frac{22}{19}\right) \left(x - \frac{33}{31}\right)$$

$$= 19 \cdot 31 \left(x - \frac{22}{19}\right) \left(x - \frac{33}{31}\right)$$

$$= 19 \left(x - \frac{22}{19}\right) (31) \left(x - \frac{33}{31}\right)$$

$$= \boxed{(19x - 22)(31x - 33)}$$

Partial Fractions  
skill.

For Calc II.

$$\underline{589x^2} - 1309x + \underline{726} = 0$$

Magic #: 427, 614  
 = 19 · 31 · 2 · 3 · 11 · 11

$$19 \overline{) 589}$$

$$\begin{array}{r} 2 \overline{) 726} \\ 3 \overline{) 363} \\ 11 \overline{) 121} \\ 11 \end{array}$$

$-1309 = -1300 - 9$	11700
$= -1200 - 109$	130800
$= -1100 - 209$	229900
$= -1000 - 309$	309000
$= -900 - 409$	368100
$= -800 - 509$	407200
$= -750 - 559$	419000
$= -700 - 609$	426300
$= -750 - 659$	494250
$= -725 - 684$	

Nope!

$$\frac{1309 \pm 55}{2(589)} \rightarrow$$

$$19 \overline{)589}$$

$$\begin{array}{r} 2 \overline{)1364} \\ 2 \overline{)682} \\ 11 \overline{)341} \\ 31 \end{array}$$

$$\begin{array}{r} 1309 \\ - 55 \\ \hline 1254 \end{array}$$

$$\frac{1309 + 55}{2(589)} = \frac{1364}{2( )} = \frac{1364}{2(19)(31)}$$

$$= \frac{\cancel{2}(2)(\cancel{11})(\cancel{31})}{\cancel{2}(19)(\cancel{31})} = \frac{22}{19}$$

$$\frac{1309 - 55}{2(19)(31)} = \frac{1254}{2(19)(31)}$$

$$\begin{array}{r} 2 \overline{)1254} \\ 3 \overline{)627} \\ 11 \overline{)209} \\ 19 \end{array}$$

$$= \frac{\cancel{2}(\cancel{3})(\cancel{11})(\cancel{19})}{\cancel{2}(\cancel{19})(\cancel{31})} = \frac{33}{31}$$

$$589 \left(x - \frac{33}{31}\right) \left(x - \frac{22}{19}\right)$$

$$= 19 \cdot 31 \left(x - \frac{33}{31}\right) \left(x - \frac{22}{19}\right)$$

$$= (31x - 33)(19x - 22)$$

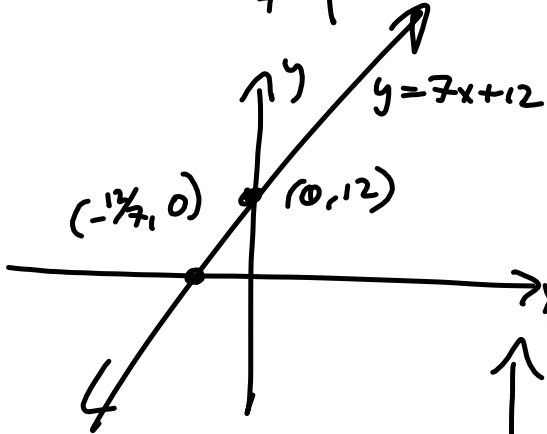


$$y = 7x + 12$$

x	y
0	12

$$-\frac{12}{7}$$

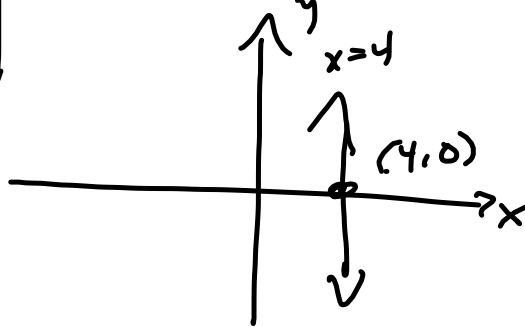
$$0$$



$$0 = 7x + 12 = 0$$

$$7x = -12$$

$$x = -\frac{12}{7}$$



$$y = 17x - 11$$

$$(5, 2)$$

parallel

$$y = m(x - x_1) + y_1$$

$$y = 17(x - 5) + 2$$

perpend.

$$m_{\perp} = -\frac{1}{m}$$

$$y = m(x - x_1) + y_1$$

$$y = -\frac{1}{17}(x - 5) + 2$$

OPLs

ordered-pair labels