

Inequalities with Fractions

<p><u>Ex. 1</u></p> $\frac{4}{3} \cdot \frac{3}{4}x > -6 \cdot \frac{4}{3}$ $\frac{12}{12}x > \frac{-24}{3}$ $x > -8$	<p><u>Summary for Ex. 1</u></p> <p>What do you do to both sides? multiply by reciprocal</p> <p>Reverse symbol? Why/why not? no b/c multiply by (+)</p>	<p><u>You Try 3</u></p> $-\frac{5}{2} \cdot -\frac{2}{5}h \leq \frac{-4}{1} \cdot \frac{5}{2}$ $-\frac{10}{10}h \leq \frac{20}{2}$ $h \geq 10 \text{ reverse}$
<p><u>Ex. 2</u></p> $(-4) \left(\frac{3y-2}{-4} \right) \geq (-1) (-4)$ $3y-2 \leq \frac{4}{1}$ $\begin{array}{r} 3y-2 \leq 4 \\ +2 \quad +2 \\ \hline 3y \leq 6 \\ \frac{3y}{3} \leq \frac{6}{3} \\ y \leq 2 \end{array}$ <p>How else could we write this?</p> $\frac{3y-2}{-4} \geq -1$ $\frac{3y+2}{-4} \geq -1$	<p><u>Summary for Ex. 2</u></p> <p>What do you do to both sides? multiply by denominator</p> <ul style="list-style-type: none"> Solve 2-step inequality <p>Reverse symbol? Why/why not? • yes when mult by -4 • no when divide by +3</p> <p>What property do you use when you solve, if you solve this way?</p> $-4 \left(\frac{3y}{-4} + \frac{-2}{-4} \right) \geq (-1) (-4)$ <p>Distributive Property</p>	<p><u>You Try 4</u></p> $\frac{2x+7}{3} > -5$ $3 \left(\frac{2x+7}{3} \right) \geq (3) (-5)$ $2x+7 \geq (3)(-5)$ $2x+7 \geq -15$ $\begin{array}{r} 2x+7 \geq -15 \\ -7 \quad -7 \\ \hline 2x \geq -22 \\ \frac{2x}{2} \geq \frac{-22}{2} \\ x \geq -11 \end{array}$

Multi-Step Inequalities

<p><u>Ex. 5</u></p> $2x - 3(3x + 2) < 8$ $2x - 9x - 6 < 8$ $\begin{array}{r} -7x - 6 < 8 \\ +6 \quad +6 \\ \hline -7x < 14 \\ \frac{-7x}{-7} < \frac{14}{-7} \\ x > -2 \end{array}$	<p><u>Summary for Ex. 6</u></p> <ol style="list-style-type: none"> 1) What simplify process do you do first? Next? • Distributive property • Combine like terms 2) What inverse operations do you use to isolate the variable? • solve 2-step inequality (add "6" on both sides) (divide both sides by -7) 3) Reverse symbol? Why or why not? yes, b/c we divided by a negative number!
<p><u>Ex. 6</u></p> $2 \leq 3x - 5(x - 2)$ $2 \leq \boxed{3x - 5x} + 10$ $2 \leq -2x + 10$ $\begin{array}{r} 2 \leq -2x + 10 \\ -10 \quad -10 \\ \hline -8 \leq -2x \\ \frac{-8}{2} \leq \frac{-2x}{-2} \\ 4 \geq x \\ x \leq 4 \end{array}$	<p><u>You Try 7</u></p> $2(x+3) - 4 > 8$ $2x + 6 - 4 > 8$ $2x + 2 > 8$ $\begin{array}{r} 2x + 2 > 8 \\ -2 \quad -2 \\ \hline 2x > 6 \\ \frac{2x}{2} > \frac{6}{2} \\ x > 3 \end{array}$

Find the Errors

- A student solved these inequalities but made two errors in each problem.
- Find the errors and EXPLAIN IN WORDS what the student should do instead.

$\frac{3}{2}x + \frac{7}{2} > 5$ $2\left(\frac{3}{2}x + \frac{7}{2}\right) > 5(2)$ $6x + 14 > 10$ $\underline{-14 \quad -14}$ $\frac{6x}{6} > \frac{-4}{6}$ $x > \frac{2}{3}$	<ul style="list-style-type: none"> • denominator cancel • 10 - 14 is (-4)
$5x - 3(2x + 5) \leq -1$ $\boxed{5x - 6x} + 15 \leq -1$ $\boxed{-1x} + 15 \leq -1$ $\underline{-15 \quad -15}$ $1x \leq -16$ $x \leq -16$	<ul style="list-style-type: none"> • 15 should be (-15) in distributive property. • Combine $5x - 6x = (-1x)$

Write the correct solutions for the two problems above.

$$8) 2\left(\frac{3}{2}x + \frac{7}{2}\right) > (5)2$$

$$3x + 7 > 10$$

$$\underline{-7 \quad -7}$$

$$\frac{3x}{3} > \frac{3}{3}$$

$$\boxed{x > 1}$$

$$9) 5x - 3(2x + 5) \leq -1$$

$$\underline{5x - 6x - 15} \leq -1$$

$$-1x - 15 \leq -1$$

$$\underline{+15 \quad +15}$$

$$-1x \leq 14$$

$$\underline{-1 \quad -1}$$

$$\boxed{x \geq -14}$$