

Remember: Dividing by a fraction is the same as multiplying by the reciprocal.

Example: $\frac{3}{5}x = 15$

$$\left(\frac{5}{3}\right) \cdot \frac{3}{5}x = 15 \cdot \left(\frac{5}{3}\right)$$

Solving Inequalities with Fractions

$$1. \frac{x}{10} - 6 > 15$$

$$\left(\frac{10}{1}\right) \frac{x}{10} > 21 \left(\frac{10}{1}\right)$$

$$x > 210$$

$$2. \frac{x-6}{10} > 15 \quad (10)$$

$$x-6 > 150$$

$$x > 156$$

$$3. \frac{-3}{8}x < 2 \quad \left(\frac{8}{3}\right)$$

$$x > -\frac{16}{3}$$

* Switch the sign!

$$4. -\frac{2}{5}x + 6 < \frac{3}{8}$$

$$-\frac{2}{5}x \left(\frac{40}{1}\right) + 6 \left(\frac{40}{1}\right) < \frac{3}{8} \left(\frac{40}{1}\right)$$

$$-16x + 240 < 15$$

$$-16x < -225$$

$$x > \frac{-225}{16}$$

LCM = 40

Multiply every term by the LCM to get rid of fractions!

* Switch the sign!

$$5. \frac{4}{3}n + \frac{2}{3} \geq -1\frac{3}{7}$$

LCM = 21

$$\frac{4}{3}n + \frac{2}{3} \geq -\frac{10}{7}$$

$$\frac{4}{3}n \left(\frac{21}{1}\right) + \frac{2}{3} \left(\frac{21}{1}\right) \geq -\frac{10}{7} \left(\frac{21}{1}\right)$$

$$28n + 14 \geq -30$$

$$28n \geq -44$$

$$n \geq -\frac{11}{7}$$

$$6. \frac{7}{12} < -n - 1\frac{2}{3}$$

$$\frac{7}{12} < -n - \frac{5}{3}$$

$$\frac{7}{12} \left(\frac{12}{1}\right) < -n \left(\frac{12}{1}\right) - \frac{5}{3} \left(\frac{12}{1}\right)$$

$$7 < -12n - 20$$

$$27 < -12n$$

$$-\frac{9}{4} > n$$

LCM = 12

* Switch the sign

Homework: Solving Inequalities With Fractions Extra Practice wkst.

Adapted:

$$n \geq -\frac{11}{7}$$

$$-\frac{9}{4} > n$$