

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

$$\begin{aligned} &+6 \quad | \quad +6 \\ (\text{10}) \frac{x}{10} &> 21 \quad (\text{10}) \\ x &> 210 \end{aligned}$$

(8) $\frac{-3}{8}x < 2$ (8)

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

* Switch the sign!

5. $\frac{4}{3}n + \frac{2}{3} \geq -1\frac{3}{7}$ LCM = 21

$$\begin{aligned} \frac{4}{3}n + \frac{2}{3} &\geq -\frac{10}{7} \\ \frac{4}{3}n \left(\frac{21}{1}\right) + \frac{2}{3} \left(\frac{21}{1}\right) &\geq -\frac{10}{7} \left(\frac{21}{1}\right) \\ 28n + 14 &\geq -30 \\ 28n &\geq -44 \end{aligned}$$

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

$$\begin{aligned} &+6 \quad | \quad +6 \\ x-6 &> 150 \\ x &> 156 \end{aligned}$$

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

$$\begin{aligned} -\frac{2}{5}x \left(\frac{40}{1}\right) + 6 \left(\frac{40}{1}\right) &< \frac{3}{8} \left(\frac{40}{1}\right) \\ -16x + 240 &< 15 \\ -16x &< -225 \\ x &> \frac{-225}{-16} \end{aligned}$$

LCM = 40
Multiply every term by the LCM to get rid of fractions!

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

$$\begin{aligned} \frac{7}{12} &< -n - \frac{5}{3} \\ \frac{7}{12} \left(\frac{12}{1}\right) &< -n \left(\frac{12}{1}\right) - \frac{5}{3} \left(\frac{12}{1}\right) \\ 7 &< -12n - 20 \\ 27 &< -12n \end{aligned}$$

* Switch the sign!

LCM = 12

Homework: Solving Inequalities With Fractions Extra Practice wkst.

Adapted:

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

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