

Chapter 4 section 8
Equation with Fractions

Review:

Solve the equation

a) $x - 5 = 6$ b) $\frac{x}{4} = 7$ c) $6x - 5 = 2$ d) $16 - 18x = 12x - 3$

Solve: $x - \frac{5}{6} = \frac{1}{3}$ similar way to solve $x - 5 = 6$

Undo subtraction by addition

Solve: $\frac{2}{3}x = \frac{4}{10}$ by using the Multiplicative Inverse Property: $\frac{a}{b} \cdot \frac{b}{a} = 1$

So take the reciprocal of the coefficient, $\frac{3}{2}$ and multiply both sides of the equation

$$\frac{2}{3} \cdot \frac{3}{2} x = \frac{4}{10} \cdot \frac{3}{2} \quad \text{Simplify}$$

$$1x = \frac{4 \cdot 3}{10 \cdot 2} \quad \text{Reduce}$$

$$1x = \frac{2 \cdot 2 \cdot 3}{2 \cdot 5 \cdot 2}$$

$$x = \frac{3}{5}$$

practice:

$$1) -\frac{2}{7}x = \frac{4}{21}$$

$$2) \frac{3}{5}x = \frac{4}{10}$$

Another way to solve equations with fraction is to clear the equations of fraction.

To do this, multiply both sides of the equation by the common denominator of all the fractions.

$$x - \frac{5}{6} = \frac{1}{3} \quad \text{The common denominator is 6 so multiply both sides of the equation by 6 and}$$

reduce

$$6\left(x - \frac{5}{6}\right) = 6\left(\frac{1}{3}\right) \quad \text{distribute the 6}$$

$$6x - 6\left(\frac{5}{6}\right) = 6\left(\frac{1}{3}\right) \quad \text{reduce. } 6\left(\frac{5}{6}\right) = 5 \text{ and } 6\left(\frac{1}{3}\right) = 2$$

$$6x - 5 = 2 \quad \text{Solve, add 5}$$

$$6x = 7 \quad \text{Divide by 6}$$
$$x = \frac{7}{6}$$

Another example: $-\frac{8}{9}x = \frac{5}{18}$

Find common denominator and multiply both sides of the equation by this number.

Practice:

$$3) \frac{2}{3}y = \frac{4}{5}$$

$$4) -\frac{2}{7}y = \frac{4}{21}$$

Example: $\frac{2}{3}x + \frac{3}{4} = \frac{1}{2}$

Practice:

$$5) \frac{2}{3} - \frac{3x}{4} = \frac{x}{2} - \frac{1}{8}$$

Example 10: page 334

The area of a triangle is 20 square inches. If the length of the base is $2\frac{1}{2}$ inches, find the height (altitude) of the triangle.