

8.11 Multiplication & Division Equations with Fractions

Use the properties of equality to isolate the variable and keep the two sides of the equation balanced.

The properties are true for whole numbers, decimals, and fractions!

"Whatever you do to one side, you must do to the other!"

Example: Solve for x.

$$1.) \quad x = 75$$

$\div \frac{5}{8}$

$$x = 75 \div \frac{5}{8}$$

$$x = \frac{75}{1} \cdot \frac{8}{5} = \frac{120}{1}$$

$x = 120$

$$2.) \quad x = 11$$

$\cdot \frac{8}{9}$

$$x = 11 \cdot \frac{8}{9}$$

$$x = \frac{11}{1} \cdot \frac{8}{9}$$

$x = \frac{88}{9} \text{ or } 9\frac{7}{9}$

$$3.) \quad x = 5\frac{5}{8}$$

$\div 5$

$$x = 5\frac{5}{8} \div 5$$

$$x = \frac{45}{8} \cdot \frac{1}{5}$$

$x = \frac{9}{8} \text{ or } 1\frac{1}{8}$

Example: Solve for x.

4.) $x = 11 \frac{7}{9} = 18$

$\div 11 \frac{7}{9}$

$x = 18 \cdot 11 \frac{7}{9}$

$x = \frac{18}{1} \cdot \frac{106}{9} = \frac{212}{1}$

$x = 212$

5.) $x = 3 \frac{3}{7} = 3 \frac{3}{7}$

$\div 3 \frac{3}{7}$

$x = 3 \frac{3}{7} \cdot \frac{7}{12}$

$x = \frac{24}{7} \cdot \frac{7}{12} = \frac{2}{1}$

$x = 2$

6.) $x = 7 \frac{7}{9}$

$\div 7 \frac{7}{9}$

$x = 7 \frac{7}{9} \div 7$

$x = \frac{70}{9} \div \frac{7}{1}$

$x = \frac{70}{9} \cdot \frac{1}{7}$

$x = \frac{10}{9}$ or $\frac{1}{9}$

Example: Solve for x.

7.) $8 \frac{4}{9} x = 1 \frac{1}{3}$

$\div 8 \frac{4}{9}$

$x = \frac{1}{3} \div 8 \frac{4}{9}$

$x = \frac{4}{3} \div \frac{76}{9}$

$x = \frac{4}{3} \cdot \frac{9}{76}$

$x = \frac{3}{19}$

$\frac{2 \cdot 2}{1 \cdot 2} + \frac{1}{2} = \frac{4}{2} + \frac{1}{2} = \frac{5}{2}$

8.) $2x + \frac{1}{2}x = 25$

$\frac{5}{2} x = 25$

$\div \frac{5}{2}$

$x = 25 \div \frac{5}{2}$

$x = \frac{25}{1} \cdot \frac{2}{5} = \frac{10}{1}$

$x = 10$