

Unit 8 Solving Equations & Inequalities

8.1 One-Step Equations

- Equation solving with rational (fraction or decimal) coefficients.

1. Solving $ax = b$

Ex. Solve:

$$a) \quad \cancel{3}x = -\frac{2}{\cancel{3}}$$

$$x = -\frac{2}{3} \times \frac{1}{3}$$

$$\boxed{x = -\frac{2}{9}}$$

$$b) \quad \cancel{2}x = \frac{3}{\cancel{4}}$$

$$x = \frac{3}{4} \times \frac{1}{2}$$

$$\boxed{x = \frac{3}{8}}$$

$$c) \quad -2\frac{1}{2}k = -3\frac{1}{2}$$

$$\cancel{-\frac{5}{2}}k = -\frac{7}{\cancel{2}}$$

$$k = -\frac{7}{2} \times -\frac{2}{5}$$

$$\boxed{k = \frac{7}{5}}$$

* improper
to ÷ or x

$$d) \quad \cancel{5.5}b = \frac{-3.41}{\cancel{5.5}}$$

$$\boxed{b = -0.62}$$

Ex. A store sells mitts at 30% off the regular price. If the sale price was \$34.99 find the regular price.

Let t = regular price

↳ 70% of the regular price = sale price

$$\cancel{0.7}t = \frac{34.99}{\cancel{0.7}}$$

$$\boxed{t = \$49.99}$$

2. Solving $\frac{x}{a} = b$

Ex. Solve:

$$a) \quad \cancel{3}\left(\frac{m}{\cancel{3}}\right) = \left(-\frac{2}{5}\right)\frac{3}{\cancel{1}}$$

$$\boxed{m = -\frac{6}{5}}$$

$$b) \quad \cancel{2}\left(\frac{x}{\cancel{2}}\right) = \left(\frac{5}{6}\right)\frac{2}{\cancel{1}}$$

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

$$c) \quad \cancel{1.3}\left(\frac{u}{\cancel{1.3}}\right) = 0.8 \quad \text{L3}$$

$$\boxed{u = 1.04}$$

3. Solving $\frac{a}{x} = b$

Ex. Solve:

$$\begin{aligned} \text{a) } \cancel{m} \left(\frac{136.68}{\cancel{m}} \right) &= (13.4) m \\ \frac{136.68}{13.4} &= \cancel{13.4} m \\ 10.2 &= m \end{aligned}$$

$$\begin{aligned} \frac{136.68}{m} &= \frac{13.4}{1} \\ m &= 1(136.68) \\ &= 13.4 \end{aligned}$$

$$\text{b) } \cancel{2x} \left(\frac{4}{5} \right) = \left(\frac{-3}{2x} \right) \cancel{2x}$$

$$\cancel{\frac{8x}{5}} = \frac{-3}{\cancel{2x} \cdot \frac{8}{5}}$$

$$x = \frac{-3}{1} \times \frac{5}{8}$$

$$x = \frac{-15}{8}$$

Ex. The formula for speed, s , is $s = \frac{d}{t}$ where d is distance and t is time. If a dogsled team averages a speed of 23.5 km/h, how long will it take to complete a 50 km circuit (nearest tenth)?

$$\begin{aligned} s &= \frac{d}{t} \\ t(23.5) &= \left(\frac{50}{\cancel{t}} \right) \cancel{t} \\ \cancel{23.5} t &= \frac{50}{\cancel{23.5}} \\ t &= 2.1 \text{ hours} \end{aligned}$$