Mathematics9 Date _____

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) $3x = -\frac{2}{3}$

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

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

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

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

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

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

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

c) $-2\frac{1}{2}k = -3\frac{1}{2}$ ★ improper fractions

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

$k = \frac{-7}{1} \times \frac{-2^{1}}{5} = \boxed{\frac{+7}{5}} \quad \boxed{= 1\frac{2}{5}}$

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

$\boxed{b = -0.62}$

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

Let x = regular price ↳ 70% of the regular price = sale price

$0.7x = 34.99$

$\frac{0.7x}{0.7} = \frac{34.99}{0.7}$

$\boxed{x = \$49.99}$

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

Ex. Solve:

a) $\frac{m}{3} = -\frac{2}{5}$

$\times 3 \quad \times 3$

$m = -\frac{2}{5} \times \frac{3}{1}$

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

b) $\frac{x}{2} = \frac{5}{6}$ $\quad \frac{x^{1}}{1}$

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

c) $\frac{u}{1.3} = 0.8$ $\quad \frac{1.3}{1}$

$\boxed{u = 1.04}$

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

Ex. Solve:

a) $\left(\frac{136.68}{m}\right) = (13.4)\,m$

$\frac{136.68}{13.4} = \frac{13.4\,m}{13.4}$

$10.2 = m$

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

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

$\frac{\frac{8}{5}}{\frac{8}{5}} = \frac{-3}{\frac{8}{5}}$

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

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

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)?

$S = \frac{d}{t}$

$t(23.5) = \left(\frac{50}{t}\right)t$

$\frac{23.5t}{23.5} = \frac{50}{23.5}$

$t = 2.1$ hours

Practice: pg. 301/ # 7 – 14, 16, 18, 19, 21 – 23, 26, 29