Chapter 5: Linear Relations, Equations, and Inequalities

5.5 Equation Solving Strategies

A. Equations Involving Fractions

* Start by eliminating fractions
  ↳ Multiply entire equation by the denominators.

Ex 1: $\frac{x}{5} + 3 = \frac{1}{2}$ (10.)

$5 \times 2 = 10$

$10 \cdot \frac{x}{5} + 10 \cdot 3 = 10 \cdot \frac{1}{2}$

$2x + 30 = 5$

$-30 \quad -30$

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

$x = -12.5$

Ex 2: $\frac{x+2}{5} + \frac{1}{4} = 5$ (20)

$5 \times 4 = 20$

$\frac{20 \cdot (x+2)}{5} + 20 \cdot \frac{1}{4} = 20 \cdot 5$

$4x + 8 + 5 = 100$

$4x + 8 + 5 = 100$

$4x + 13 = 100$

$-13 \quad -13$

$\frac{4x}{4} = \frac{87}{4}$

$x = 21.75$

B. Equations with a) Like Terms and b) Variables on Both Sides

Ex 1: $3x + 5x - 2 = 4x + 10$

$8x - 2 = 4x + 10$

$+2 \quad +2$

$8x = 4x + 12$

$-4x \quad -4x$

$\frac{4x}{4} = \frac{12}{4}$

$x = 3$

Ex 2: $8a + 1 = 5a - 4$

$-5a - 1 \quad -5a - 1$

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

$a = \frac{-5}{3} = -1\frac{2}{3} = -1.\overline{6}$

Homework: pg. 243 #5bf, 7, 8, 9bd, 13bdf, 14df, 17b

5.5 continued

$$\frac{3}{x} = 6 + \frac{1}{2}$$

$6\frac{1}{2} = \frac{13}{2}$

$$\frac{3}{x} = \frac{13}{2}$$

$$6 = 13x$$

$$\boxed{x = \frac{6}{13}}$$

* When variable is in the denominator, rearrange to fraction = fraction

↳ cross multiply ÷ divide