Solving Multi-Step Equations

1 $6x + 3 - 8x = 13$

2 $3x - 8 + 2x + x = 40$

1 **1** $\dfrac{-2}{5}m + 2 = \dfrac{1}{5}m + 11$

1 **2** $\dfrac{2}{3}x + \dfrac{1}{2} = \dfrac{3}{5}x - \dfrac{5}{6}$

Involving Fractions

9 $\dfrac{2}{7}d - \dfrac{1}{7} = \dfrac{3}{14}$

1 0 $\dfrac{1}{3}x + \dfrac{1}{4} = \dfrac{5}{12}$

3 $17 = 3(g - 5) + 8$

4 $-2(3 - d) + 5d = 8$

Combining Like Terms

5 $5x - 2 = 3x + 4$

6 $2(y + 6) = 3y$

7 $2k - 5 = 3(1 - 2k)$

8 $-14 - 5b + 2b = -2 - 2(1 - b)$

Variables on Both Sides

Answer Key!

Solving
Multi-Step
Equations

① $(6x) + 3 (-8x) = 13$

$-2x + 3 = 13$
$\; -3 \quad -3$
$\overline{\qquad\qquad}$
$-2x = 10$
$-2 \quad -2$
$\boxed{x = -5}$

② $(3x) - 8 (+2x)(+x) = 40$

$6x - 8 = 40$
$\; +8 \quad +8$
$\overline{\qquad\qquad}$
$6x = 48$
$6 \qquad 6$
$\boxed{x = 8}$

① ① $\dfrac{-2}{5} m + 2 = \dfrac{1}{5} m + 11$

$\dfrac{-2}{5}m + \dfrac{2}{1} = \dfrac{1}{5} m + \dfrac{11}{1}$

$\dfrac{-2}{5}m + \dfrac{10}{5} = \dfrac{1}{5} m + \dfrac{55}{5}$

$5 \cdot \left(\dfrac{-2}{5}m + \dfrac{10}{5}\right) = \left(\dfrac{1}{5} m + \dfrac{55}{5}\right) \cdot 5$

$-2m + 10 = 1m + 55$
$+2m \qquad\quad +2m$
$\overline{\qquad\qquad\qquad\qquad}$
$10 = 3m + 55$
$-55 \qquad\quad -55$
$\overline{\qquad\qquad\qquad\qquad}$
$\dfrac{-45}{3} = \dfrac{3m}{3}$

$-15 = m$

$\boxed{m = -15}$

① ② $\dfrac{2}{3} x + \dfrac{1}{2} = \dfrac{3}{5} x - \dfrac{5}{6}$

$\dfrac{20}{30}x + \dfrac{15}{30} = \dfrac{18}{30}x - \dfrac{25}{30}$

$30 \cdot \left(\dfrac{20}{30}x + \dfrac{15}{30}\right) = \left(\dfrac{18}{30}x - \dfrac{25}{30}\right) \cdot 30$

$20x + 15 = 18x - 25$
$-18x \qquad\quad -18x$
$\overline{\qquad\qquad\qquad\qquad}$
$2x + 15 = -25$
$\; -15 \quad -15$
$\overline{\qquad\qquad\qquad\qquad}$
$\dfrac{2x}{2} = \dfrac{-40}{2}$
$\boxed{x = -20}$

Involving Fractions

9 $\frac{2}{7}d - \frac{1}{7} = \frac{3}{14}$

$$\frac{4}{14}d - \frac{2}{14} = \frac{3}{14}$$

$$14 \cdot \left(\frac{4}{14}d - \frac{2}{14}\right) = \left(\frac{3}{14}\right) \cdot 14$$

$$4d - 2 = 3$$

$$\underline{ +2 \quad +2}$$

$$\frac{4d}{4} = \frac{5}{4}$$

$$\boxed{d = 1.25}$$

10 $\frac{1}{3}x + \frac{1}{4} = \frac{5}{12}$

$$\frac{4}{12}x + \frac{3}{12} = \frac{5}{12}$$

$$12 \cdot \left(\frac{4}{12}x + \frac{3}{12}\right) = \left(\frac{5}{12}\right) \cdot 12$$

$$4x + 3 = 5$$

$$\underline{ -3 \quad -3}$$

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

$$\boxed{x = 0.5}$$

3 $17 = 3(g - 5) + 8$

$$17 = 3g \;\boxed{-15}\;\boxed{+8}$$

$$17 = 3g - 7$$

$$\underline{+7 \qquad\quad +7}$$

$$\frac{24}{3} = \frac{3g}{3}$$

$$8 = g$$

$$\boxed{g = 8}$$

4 $-2(3 - d) + 5d = 8$

$$-6 \;\boxed{+ 2d}\;\boxed{+ 5d} = 8$$

$$-6 + 7d = 8$$

$$+6 \qquad\qquad +6$$

$$\frac{7d}{7} = \frac{14}{7}$$

$$\boxed{d = 2}$$

Combining Like Terms

5 $5x - 2 = 3x + 4$

$\underline{-3x \qquad -3x}$

$2x - 2 = 4$

$\underline{+2 \qquad +2}$

$\dfrac{2x}{2} = \dfrac{6}{2}$

$\boxed{x = 3}$

6 $2(y + 6) = 3y$

$2y + 12 = 3y$

$\underline{-2y \qquad -2y}$

$12 = y$

$\boxed{y = 12}$

7 $2k - 5 = 3(1 - 2k)$

$2k - 5 = 3 - 6k$

$\underline{+6k \qquad\quad +6k}$

$8k - 5 = 3$

$\underline{+5 \quad +5}$

$\dfrac{8k}{8} = \dfrac{8}{8}$

$\boxed{k = 1}$

8 $-14 - 5b + 2b = -2 - 2(1 - b)$

$-14 \;\boxed{- 5b}\;\boxed{+ 2b} = -2 - 2 + 2b$

$-14 - 3b = -4 + 2b$

$\underline{+3b \qquad\qquad +3b}$

$-14 = -4 + 5b$

$\underline{+4 \qquad +4}$

$\dfrac{-10}{5} = \dfrac{5b}{5}$

$-2 = b$

$\boxed{b = -2}$
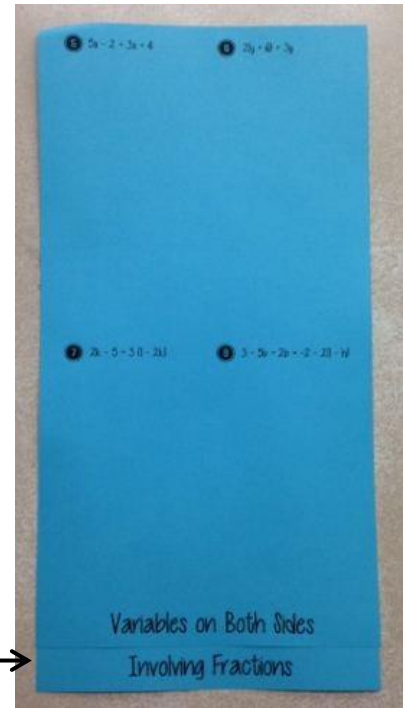
Variables on Both Sides

Directions:

<u>Step 1</u>: Photo copy pages 1&2, 3&4 front to back (flip along the short edge).

<u>Step 2</u>: Cut off the strip along the side, and discard.

<u>Step 3</u>: Line up the two pages as shown to the right.

Be sure to line up the bottom of the two pieces, like this ⟶

<u>Step 4</u>: Fold over the top portion and secure with a few staples.

The final product should look like this: