1.6 Solving Linear and Literal Equations

Example 1: $\frac{2}{3}h - 9 = -\frac{1}{2}h + 4$

$\frac{4}{6}h$

$2\cdot\ \frac{2}{3}h - 9 = -\frac{1}{2}h + 4$

$3\cdot\ -\frac{1}{2}h \quad -\frac{3}{6}h \qquad +\frac{1}{2}h$

$\frac{7}{6}h - 9 = 4$

$+9 \qquad +9$

$\frac{6}{7}\cdot\frac{7}{6}h = \frac{13}{1}\cdot\frac{6}{7}$

$h = \frac{78}{7}$

Example 2: $6\left(\frac{1}{3}m - \frac{4}{3}\right) = 6\left(-\frac{1}{6}m - 1\right)$

$2m - 8 = -m - 6$

$+m \qquad +m$

$3m - 8 = -6$

$+8 \qquad +8$

$\frac{3m}{3} = \frac{2}{3}$

$m = \frac{2}{3}$

Example 3: Solve for the indicated variable.

$2 \cdot \frac{1}{2}bh = A \cdot 2$ for b

$\frac{bh}{h} = \frac{2A}{h}$

$\boxed{b = \frac{2A}{h}}$

Example 4: Solve for the indicated variable.

$(k-2)\, m = \frac{k+4}{k-2} \cdot (k-2)$ for k

$km - 2m = k + 4$

$-km \quad -km$

$-2m = k + 4 - km$

$-4 \quad -4$

$-2m - 4 = k - km$

$\frac{-2m-4}{1-m} = \frac{k(1-m)}{1-m}$

$\boxed{\frac{-2m-4}{1-m} = k}$

Example 5: Solve for the indicated variable.

$Rr_1r_2 \cdot \left(\frac{1}{R}\right) = \left(\frac{1}{r_1} + \frac{1}{r_2}\right) \cdot Rr_1r_2$ for r_1

$\frac{Rr_1r_2}{1} \cdot \frac{1}{R} = \frac{Rr_1r_2}{1} \cdot \frac{1}{r_1} + \frac{Rr_1r_2}{1} \cdot \frac{1}{r_2}$

$r_1r_2 = Rr_2 + Rr_1$

$-Rr_1 \qquad -Rr_1$

$r_1r_2 - Rr_1 = Rr_2$

$\frac{r_1(r_2 - R)}{r_2 - R} = \frac{Rr_2}{r_2 - R}$

$$\boxed{r_1 = \frac{Rr_2}{r_2 - R}}$$