1. Solve: $12(x - 4) + 3 = 2(6x + 5)$

$12x - 48 + 3 = 12x + 10$

$12x - 45 = 12x + 10$

$-12x \quad -12x$

$-45 = 10$

$\emptyset$

2. Translate into a verbal expression:

A. $4(15 - x) + 7$ Four times the difference of 15 and a number plus 7

B. $\frac{1}{4}x + y$ one fourth of a number plus another number

3. Solve:

$$\frac{7}{8}x - 5 = \frac{1}{2}x + 9 \quad (8)$$

$$7x - 40 = 4x + 72$$

$$-4x \quad -4x$$

$$3x - 40 = 72$$

$$+40 \quad +40$$

$$\frac{3x}{3} = \frac{112}{3}$$

$$x = 34$$

$A = lw$

$2wv = y$

Literal Equations

$2f = g$

$ab = \frac{c}{2}$

MULTI-VARIABLE EQUATIONS
(Literal Equations)

SOLVE EACH OF THE EQUATIONS BELOW FOR x:

$2x - 5 = 13$

$+5 \quad +5$

$\frac{2x}{2} = \frac{18}{2}$

$x = 9$

$ax - b = c$

$+b \quad +b$

$\frac{ax}{a} = \frac{b+c}{a}$

$x = \frac{b+c}{a}$

One-Step Problems

1. $A = lw$ solve for w $\frac{A}{l} = \frac{lw}{l}$ $w = \frac{A}{l}$	**2.** $A = bh$ solve for h $\frac{A}{b} = \frac{bh}{b}$ $h = \frac{A}{b}$	**3.** $d = rt$ solve for t $\frac{d}{r} = \frac{rt}{r}$ $t = \frac{d}{r}$
4. $I = Prt$ solve for t $\frac{I}{Pr} = \frac{Prt}{Pr}$ $t = \frac{I}{Pr}$	**5.** $V = lwh$ solve for h $\frac{V}{lw} = \frac{lwh}{lw}$ $h = \frac{V}{lw}$	**6.** $C = 2\pi r$ solve for r $\frac{C}{2\pi} = \frac{2\pi r}{2\pi}$ $r = \frac{C}{2\pi}$
7. $m = c - s$ solve for c $+s \quad +s$ $c = m + s$	**8.** $A = \pi r^2$ solve for π $\frac{A}{r^2} = \frac{\pi r^2}{r^2}$ $\pi = \frac{A}{r^2}$	**9.** $D = \frac{m}{v}$ solve for m (v) $m = DV$

Multi-Step Problems

Hints to help:

- Think backwards PEMDAS
- Remove fractions by multiplying by the reciprocal.
- Last step is USUALLY to divide by whatever is next to your variable.

10. $A = \frac{1}{2}bh$ solve for h

(2) (2)

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

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

11. $V = \frac{1}{3}Bh$ solve for B

(3) (3)

$\frac{3V}{h} = \frac{Bh}{h}$

$B = \frac{3V}{h}$

12. $K = \frac{mv^2}{2}$ solve for m

(2) (2)

$\frac{2K}{v^2} = \frac{mv^2}{v^2}$

$m = \frac{2K}{v^2}$

13. $a = \frac{b+c}{d}$ solve for b

(d) (d)

$ad = b + c$

$-c \quad -c$

$b = ad - c$

14. $P = 2L + 2W$ solve for W

$-2L \quad -2L$

$\frac{P-2L}{2} = \frac{2W}{2}$

$W = \frac{P-2L}{2}$

$W = \frac{P}{2} - L$

15. $Ax + By = C$ solve for y

$-Ax \quad -Ax$

$\frac{By}{B} = \frac{-Ax+C}{B}$

$y = \frac{-Ax+C}{B}$

16. $y = mx + b$ solve for x

$-b \quad -b$

$y - b = mx$

$\frac{y-b}{m} = \frac{mx}{m}$

$x = \frac{y-b}{m}$

17. $A = P + Prt$ solve for t

$-P \quad -P$

$A - P = Prt$

$\frac{A-P}{Pr} = \frac{Prt}{Pr}$

$t = \frac{A-P}{Pr}$

18. $s = n(a + 1)$ solve for a

$\frac{s}{n} = a + 1$

$-1 \quad -1$

$a = \frac{s}{n} - 1$

19. Solve $C = \frac{5}{9}(F - 32)$ for F

$\left(\frac{9}{5}\right) \quad \left(\frac{9}{5}\right)$

$\frac{9}{5}C = F - 32$

$+32 \quad +32$

$F = \frac{9}{5}C + 32$

20. Solve $A = \frac{1}{2}h(b_1 + b_2)$ for b_1

$(2h) \quad (2h)$

$2Ah = b_1 + b_2$

$-b_2 \quad -b_2$

$b_1 = 2Ah - b_2$