

Name: key Date: _____

Rearranging Formulas

When solving literal equations, we will follow the same steps as solving any other equations. The SADMEP pattern is useful way to remember your order of operations.

Solve the following pairs of equations for x:

1a) $x - 7 = 8$ $\begin{array}{r} +7 \quad +7 \\ \hline x = 15 \end{array}$	1b) $x - b = a$ $\begin{array}{r} +b \quad +b \\ \hline x = a + b \end{array}$
2a) $4x = -12$ $\begin{array}{r} \frac{4x}{4} = \frac{-12}{4} \\ x = -3 \end{array}$	2b) $-3x = m$ $\begin{array}{r} \frac{-3x}{-3} = \frac{m}{-3} \\ x = \frac{m}{-3} \end{array}$
3a) $2x - 5 = 11$ $\begin{array}{r} +5 \quad +5 \\ \hline 2x = 16 \\ \frac{2x}{2} = \frac{16}{2} \\ x = 8 \end{array}$	3b) $2x - 9 = d$ $\begin{array}{r} +9 \quad +9 \\ \hline 2x = d + 9 \\ \frac{2x}{2} = \frac{d+9}{2} \\ x = \frac{d+9}{2} \end{array}$

For the following problems, use the left-hand side to solve for the requested variable. Use the right-hand side to explain what you did each step. If your right-hand side doesn't match SADMEP, you might want to re-think your steps.

Work	Reasons
4) $ax + by = c$ (solve for y)	Given
$by = -ax + c$	Subtracted ax
$y = \frac{-ax + c}{b}$	Divided by b

Work	Reasons
5) $D = \frac{1}{4}j(7f + g)$ (Solve for g)	Given
$4D = j(7f + g)$	Multiplied 4
$\frac{4D}{j} = 7f + g$	Divided by j
$\frac{4D}{j} - 7f = g$	Subtracted $7f$

6) $A = \frac{a+b}{2}$; solve for b

$$2A = a + b$$

$$2A - a = b$$

7) $V = lwh$; solve for w

$$\frac{V}{hl} = w$$

8) $P = 2(l + w)$; solve for l

$$\frac{P}{2} = l + w$$

$$\frac{P}{2} - w = l$$

9) $D = \frac{11}{5}(P - 15)$; solve for P

$$5D = 11(P - 15)$$

$$\frac{5D}{11} = P - 15$$

$$\frac{5D}{11} + 15 = P$$

10) $F = \frac{rt}{d}$; solve for r

$$dF = rt$$

$$\frac{dF}{t} = r$$

11) $K = \frac{1}{2}mv^2$; solve for m

$$2K = mv^2$$

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

12) $P = a + b + c$; solve for b

$$-a - c + P = b$$

13) $\frac{12ds}{w} = CD$; solve for w

$$12ds = CDw$$

$$\frac{12ds}{CD} = w$$

14) $5t - 2r = 25$; solve for t

$$5t = 2r + 25$$

$$t = \frac{2r + 25}{5}$$

$$t = \frac{2}{5}r + 5$$

15) $V = \frac{1}{3}\pi h^2(r - 3h)$; Solve for r

$$3V = \pi h^2(r - 3h)$$

$$\frac{3V}{\pi h^2} = r - 3h$$

$$3h + \frac{3V}{\pi h^2} = r$$