

3-8-1 Literal Equations

When using a formula in a spreadsheet, the desired variable is to be solved for before the numbers are input.

When you did the formulas page, known values were input, and then you solved for the unknown. Now you solve for the unknown without replacing other variables with known values.

Look through the examples. Then work the problems that follow. Be careful with the order of operations as you simplify.

Compare the equations.

$\begin{array}{r} 5 = 9 + y \\ -9 \quad -9 \\ \hline -4 = y \end{array}$	<p>Solve for y. Subtract from both sides to get y by itself. m and n are not like terms so can not be combined. The equation on the right is a literal equation.</p>		$\begin{array}{r} m = n + y \\ -n \quad -n \\ \hline m - n = y \end{array}$
Practice:	Solve for the indicated variable.		
a) $w + x = y$ for x	$a + b = c + d$ for a	$E = f - g$ for f	$A = a + s$ for a
b) $zx = r$ for z	$mn = t$ for n	$e = df$ for d	$ab = c$ for b
$\begin{array}{r} 4d - 3 = 10 \\ +3 \quad +3 \\ \hline 4d = 13 \\ \frac{4d}{4} = \frac{13}{4} \\ d = \frac{13}{4} \end{array}$	<p>Solve for d. Add to both sides. Divide. x and f are not like terms so just write the addition. The parentheses are in the final answer to guarantee the addition is done first.</p>		$\begin{array}{r} ad - f = x \\ +f \quad +f \\ \hline ad = x + f \\ \frac{ad}{a} = \frac{x + f}{a} \\ d = \frac{(x+f)}{a} \end{array}$
c) $ab - c = d$ for b	$3 = xy - t$ for x	$Rs - t = y$ for s	
d) $mn - ab = 0$ for n	$St = yz$ for t	$uv - w = a$ for v	
e) $e - f = h$ for f	$7 - df = e$ for d	$de = ad$ for e	
f) $m + a = t + h$ for m	$2xy - z = mn$ for x	$sl + ov = e$ for s	

Practice: Solve for the indicated variable. These are formulas worked with in section 3-2

a) Solve for w. $P=2w+2l$

Solve for l. $A=lw$

b) Solve for s. $P=4s$

$$A = s^2$$

Solve for s. $\sqrt{A} = \sqrt{s^2}$

$$\sqrt{A} = s$$

c) Solve for c. $P=a+b+c+d$

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

d) Solve for a. $P=a+b+c$

Solve for h. $A= \frac{1}{2} (bh)$

e) Solve for r. $C=2Br$

Solve for r. $A=Br^2$

f) Solve for w. $S=2lw+2wh+2lh$

Solve for w. $V=lwh$

g) Solve for h. $SA= 2Br^2+ 2Brh$

Solve for h. $V = Br^2h$

h) Solve for s. $SA= Br^2+Brs$

Solve for h. $V= \frac{1}{3} Br^2h$

i) Solve for h. $SA= 4(\frac{1}{2} bh) + b^2$

Solve for h. $V=1/3 Bh$

j) Solve for r. $p=c+rc$

Solve for r. $p=c - rc$

k) Solve for r. $I=Prt.$

Solve for P. $A = P \left(1 + \frac{r}{m} \right)^{mt}$

l) Solve for r. $d=rt$

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

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

n) Solve for x_1 .

$$A = \frac{x_1 + x_2 + \dots + x_n}{n}$$