Literal Equations Review Name KEY

A literal equation is an equation that contains multiple variables.

- The goal of a literal equation is to isolate a particular variable (not always x)!

1. Solve for a.

$ax + b = c$

$-b \quad -b$

$\frac{ax}{x} = \frac{c-b}{x}$

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

or

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

2. Solve for w.

$V = lwh$

$lh \quad lh$

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

3. Solve for b.

$2 \cdot A = \frac{y+b}{2} \cdot 2$

$2A = y + b$

$-y \quad -y$

$2A - y = b$

4. Solve for x.

(combine like terms first)

$3x + 5x - 7y = z$

$8x - 7y = z$

$+7y \quad +7y$

$\frac{8x}{8} = \frac{z+7y}{8}$

$x = \frac{z+7y}{8}$

or

$x = \frac{z}{8} + \frac{7}{8}y$

5. Solve for w.

$w \cdot CD = \frac{12s}{w} \cdot w$

$\frac{W \cdot CD}{CD} = \frac{12s}{CD}$

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

6. Solve for t.

$\frac{t}{5} - 4r = 25$

$+4r \quad +4r$

$5 \cdot \left(\frac{t}{5}\right) = (25 + 4r) \cdot 5$

$t = 125 + 20r$

7. The formula for a person's typing speed is $s = \frac{w - 10e}{m}$, *where* s is speed in words per minute, w is number of words typed, e is number of errors, and m is number of minutes typing.

a. Solve for e. $s = \frac{w-10e}{m} \cdot m \rightarrow sm = w - 10e \rightarrow \frac{sm-w}{-10} = \frac{-10e}{-10} \rightarrow \boxed{\frac{sm-w}{-10} = e}$

b. **Using your formula from part a**, find the number of errors when you type 500 words for 10 $= m$ minutes at a speed of 40 words per minute. $= w$ $= s$

$\frac{40 \cdot 10 - 500}{-10} = e$

$\frac{400-500}{-10} = e \rightarrow \frac{-100}{-10} = e \rightarrow 10 = e$

10 errors

8. The formula $I = Prt$ can be used to determine the interest I that is earned on a principal amount of money P, when the money is invested at an annual percentage rate r for t years.

a. Solve the formula $I = Prt$ for t. $\frac{I}{Pr} = \frac{Prt}{Pr}$ $\boxed{\frac{I}{Pr} = t}$

b. If a couple invests $5000 in an account that earns a 3% interest rate, how long will they need to invest it to earn $1200 in interest? (Hint: Convert the interest rate to a decimal.)

I P $.03 = r$

$\frac{1200}{5000 \cdot .03} = t$

$\frac{1200}{150} = t \rightarrow 8 = t$ 8 years

9. $\frac{2}{5}(-10a + 5b) = d$ Solve for a $\cdot \frac{5}{2}$

$-10a + 5b = \frac{5}{2}d$

$-5b \quad -5b$

$\frac{-10a}{-10} = \frac{\frac{5}{2}d - 5b}{-10}$ -10

multiply by reciprocal

$\frac{\frac{5}{2}}{-10} = \frac{5}{2} \div \frac{-10}{1} = \frac{5}{2} \cdot \frac{1}{-10} = \frac{5}{-20} = -\frac{1}{4}$

$\boxed{a = -\frac{1}{4}d + \frac{1}{2}b}$