

Math 80 Worksheet #1 Solutions

1. Solve $A = p + prt$ for the variable t ($p \neq 0$, $r \neq 0$).

Using the additive property of equality: $A - p = p + prt - p \Rightarrow A - p = prt$

Using the multiplicative property of equality: $\frac{A-p}{pr} = \frac{prt}{pr} \Rightarrow \frac{A-p}{pr} = t$

$$\text{So } t = \frac{A-p}{pr}$$

2. When the smaller of two consecutive numbers is added to three times the larger, the result is 51. Find the integers.

Let the smaller of the two consecutive numbers be x . Then the larger is $x + 1$.

$$\begin{aligned} \text{We have that } x + 3(x + 1) = 51 &\Rightarrow x + 3x + 3 = 51 \\ &\Rightarrow 4x + 3 = 51 \\ &\Rightarrow 4x = 48 \\ &\Rightarrow x = 12 \end{aligned}$$

So, the smaller integer is 12 and the larger is 13.

3. You have a yard (36 inches) of fabric and you make two cuts, which produces three strips of fabric. The longest strip is 1 less than 3 times the length of the shortest strip and the middle-sized strip is 1 more than twice the length of the shortest strip. How long are each of the strips?

We have 3 unknowns and assigning x to be the length of the shortest strip, we have:

$$\begin{aligned} \text{Length of the shortest strip} &= x \\ \text{Length of the middle-sized strip} &= 2x + 1 \\ \text{Length of the longest strip} &= 3x - 1 \end{aligned}$$

Given that we have 36 inches of fabric, we have the following equation:

$$x + (2x + 1) + (3x - 1) = 36 \Rightarrow 6x = 36 \Rightarrow x = 6$$

So, the shortest piece is 6 inches, the middle-sized piece is 13 inches, and the longest strip is 17 inches.

4. What amount of pure gold is found in 16 ounces of 18 carat gold? (Note: 24 carat gold is pure gold.)

Since 24 carat gold is pure, 18 carat gold is 75% pure gold and 25% metal alloy ($\frac{18}{24} = \frac{3}{4} = .75$).

So, the amount of pure gold in 16 ounces of 18 carat gold is $.75(16) = 12$ ounces or $\frac{3}{4}(16) = 12$ ounces.