TIPS Problems Involving Equations

1. In $\triangle ABC$, the measure of $\angle ABC$ is double the measure of $\angle CAB$. The measure of $\angle BCA$ is 30° greater than the measure of the smaller of the other two angles. Find the measure of each angle.

2. Naquan is saving nickels and dimes in a jar. The jar contains 10 more nickels than dimes. Altogether, the value of the coins is $16.25. How many nickels and dimes are in the jar?

Coin	Value of One Coin	Number of Coins	Value of Coins
Dime	$0.10	d	
Nickel	$0.05		
Total	N/A		$16.25

Nickel = 5¢ = $0.05

Dime = 10¢ = $0.10

3. Solution A is 50% hydrochloric acid by volume, while solution B is 75% hydrochloric acid by volume. How many litres of each solution should be used to make 100 litres of a solution which is 60% hydrochloric acid by volume?

Solution (of Problem)

Solution	% of acid	Volume of the Solution (L)	Volume of Acid in the Solution (L)
Solution A	50% = 0.5	a	
Solution B	75% = 0.75		
Mixture	60% = 0.6	100	

4. To make lower-fat chocolate frozen yogurt, chocolate milk containing 2% butterfat is needed. To obtain the required percentage of butterfat, chocolate milk containing 4% butterfat is mixed with 500 litres of chocolate milk containing 1% butterfat.

(a) Without performing any calculations, predict whether the mixture will contain more of the 1% chocolate milk or more of the 4% chocolate milk. Explain.

(b) How many litres of the 4% chocolate milk are needed to create the required mixture? What is the total volume of the mixture?

Solution

Let x represent the number of litres of the 4% chocolate milk that must be mixed with 500 L of the 1% chocolate milk to produce a mixture containing 2% butterfat.

Type of Chocolate Milk	*Volume (L)*	*Amount of Butterfat in Given Volume (L)*
1% butterfat	500	
4% butterfat	x	
2% butterfat mixture		

(c) Does your answer in part (b) agree with the prediction that you made in part (a)? What can you conclude from this?