Name: $\qquad$ Date: $\qquad$ Block: $\qquad$

## Solution Composition Calculations (NO CALCULATORS)

1. A 200 mL solution is made by dissolving 3 moles of solute in water. What is the molarity of the resulting solution?
2. How many moles of solute is needed to make 500 mL of a 6 M solution?
3. You need to make 300 mL of a 4 M KCl solution? The molar mass of KCl is $75 \mathrm{~g} / \mathrm{mol}$.
a. How many grams of KCl are needed to make the solution?
b. Describe how you would make the KCl solution in lab (refer to textbook pg. 149

Figure 4.10)
4. You wish to prepare a 0.3 M HCl solution with a volume of 250 mL .
a. How many milliliters of a concentrated 12 M HCl solution will you need?
b. Describe how you would make the diluted solution in lab. (refer to textbook pg. 153

Figure 4.12 as reference, but your book should state that there should be a some water in the flask before the acid is added because ACID IS ALWAYS ADDED TO WATER!!!!)
5. A salt water solution is made by dissolving 20 grams of NaCl in water. The total mass of solution is 160 grams. Which of the following is the approximate mass percent of salt in the solution?
a. $10 \%$
b. $12 \%$
c. $20 \%$
d. $25 \%$
6. A solution of antifreeze is made by mixing equal volumes of ethylene glycol ( $\mathrm{d}=1.1 \mathrm{~g} / \mathrm{mL}$ ) and water ( $\mathrm{d}=1.0 \mathrm{~g} / \mathrm{mL}$ ). Which of the following is the approximate mass percent of ethylene glycol in the solution?
a. $48 \%$
b. $50 \%$
c. $52 \%$
d. $60 \%$

