Dilution Review: $M_1V_1 = M_2V_2$ Name: _____

1) You start with 20.0 mL of 0.75 M KI and you add 5.0 mL of water. Find the new, dilute molarity of KI.

M_1= 0.75
V_1= 20.0mL
M_2= ? M
V_2= 25.0mL

$(0.75M)(20.0mL) = M_2(25.0mL)$

$M_2 = 0.60M$

2) You add 10.0 mL of water to 15.0 mL (V_1) of 3.0 M NaCl (M_1). Find the new molarity of NaCl.

$(3.0M)(15.0mL) = M_2(25.0mL)$ $M_2 = 1.8M$

3) You start with 15.0 mL (V_1) of 0.10 M Na_2SO_4 (M_1) and you add 10.0 mL of water. What is your new molarity?

$(0.10M)(15.0mL) = M_2(25.0mL)$ 0.060M

4) DO THIS ONE WITHOUT A CALCULATOR. You start with 10.0 mL of 1.0 M NaCl. You add 10.0 mL of water. What is your new NaCl molarity?

$(1.0M)(10.0mL) = M_2(20.0mL)$ = 0.50 M

5) You have a solution of salt water that you leave open to the air on a hot day. After a few hours, what do you think has occurred to the concentration of the salt water? Explain!

NaCl concentration has increased due to evaporation of water, leaving NaCl ratio to H_2O higher.

6) You have a 50.0 mL of a 2.50 M NaCl solution. You leave it out open in the sun, and return to find that you only have 40.0 mL of liquid left. Assuming none of the NaCl evaporated (only the water did), find the new, more concentrated molarity.

$(2.50M)(50.0mL) = M_2(40.0mL)$

M_2 = 3.13 M NaCl

7) Normal saline solution used to hydrate to hydrate people intravenously has a NaCl concentration of 0.90%. this is about 9.0 grams per liter. Find the molarity of this NaCl solution.

$9.0g\ NaCl\left(\frac{1mol}{58.44g}\right) = \frac{0.154\ mol\ NaCl}{1L}$ = 0.15 M NaCl