Dilution Worksheet (KEY)

1. $M_f = \frac{M_i V_i}{V_f} = \frac{(0.416\ M)(0.5000\ L)}{0.6000\ L} =$ **0.347 M**

2. $M_f = \frac{M_i V_i}{V_f} = \frac{(6.0\ M)(0.400\ L)}{0.600\ L} =$ **4.0 M H_2SO_4**

3. $V_f = \frac{M_i V_i}{M_f} = \frac{(3.0\ M)(0.500\ L)}{1.0\ M} =$ **1.5 L total**

   $1.5\ L - 0.500\ L =$ **1.0 L H_2O added** OR 1.0×10^3 mL

4. $M_f = \frac{M_i V_i}{V_f} = \frac{(0.200\ M)(0.3000\ L)}{0.5000\ L} =$ **0.120 M KOH**

5. $M_f = \frac{M_i V_i}{V_f} = \frac{(0.75\ M)(0.020\ L)}{0.090\ L} =$ **0.17 M HBr**

6. $M_f = \frac{M_i V_i}{V_f} = \frac{(12\ M)(0.050\ L)}{0.250\ L} =$ **2.4 M HCl**

7. $\frac{122\ g\ NH_4I \mid 1\ mol\ NH_4I}{144.9\ g\ NH_4I} = 0.8420\ mol\ NH_4I$

   $M = \frac{mol}{V} = \frac{0.8420\ mol}{0.1000\ L} = 8.42\ M = M_i$

   $M_f = \frac{M_i V_i}{M_f} = \frac{(8.42\ M)(0.1000\ L)}{2.0\ M} = 0.42\ L$ (total)

   $0.421\ L - 0.1000\ L =$ **0.32 L H_2O added**

8. $V_f = \frac{M_i V_i}{M_f} = \frac{(0.10\ M)(0.3000\ L)}{0.050\ M} = 0.60\ L$ (total)

   $0.60\ L - 0.3000\ L$ (START) = **0.30 L H_2O added**

9. $V_i = \frac{M_f V_f}{M_i} = \frac{(0.15\ M)(0.200\ L)}{0.95\ M} =$ **0.032 L required**