How would you dilute 20 mL of a 2.0 M NaCl solution to make a 1.0 M solution?

You have 15 mL of a 4.0 M glucose solution. What total volume is needed to make a 2.0 M solution?

Dilute 10 mL of a 3.5 M KCl solution to make a 0.5 M solution. What is the final volume?

How would you prepare 1.0 M HCl from 30 mL of a 6.0 M stock?

You need to make 0.25 M of NaOH from a 1.0 M solution. What volume should 40 mL be diluted to?

If you have 50 mL of a 5.0 M $CaCl_2$ solution, how much water is needed to make a 1.0 M solution?

How would you dilute 20 mL of a 2.0 M NaCl solution to make a 1.0 M solution?

$$C_1 V_1 = C_2 V_2$$

$$[2\,M][20\,mL] = [1\,M]\,V_2$$

$$V_2 = \frac{(2\,M)(20\,mL)}{1\,M}$$

$$V_2 = 40\,mL$$

$$\boxed{V_2 = 40\,mL}$$

You have 15 mL of a 4.0 M glucose solution. What total volume is needed to make a 2.0 M solution?

$$C_1 V_1 = C_2 V_2$$

$$[4.0\,M][15\,mL] = [2.0\,M]\,V_2$$

$$V_2 = \frac{(4\,\cancel{M})(15\,mL)}{2\,\cancel{M}}$$

$$V_2 = 30\,mL$$

$$\boxed{V_2 = 3.0 \times 10^{1}\,mL}$$

Dilute 10 mL of a 3.5 M KCl solution to make a 0.5 M solution. What is the final volume?

$$C_1 V_1 = C_2 V_2$$

$$[3.5\ M][10\ mL] = [0.5\ M]\ V_2$$

$$V_2 = \frac{(3.5\ M)(10\ mL)}{0.5\ M}$$

$$V_2 = 70\ mL$$

$$\boxed{V_2 = 70\ mL}$$

How would you prepare 1.0 M HCl from 30 mL of a 6.0 M stock?

$$C_1 V_1 = C_2 V_2$$

$$[6.0\,M][30\,mL] = [1.0\,M]\,V_2$$

$$V_2 = \frac{(6.0\,M)(30\,mL)}{1.0\,M}$$

$$V_2 = 180\ mL$$

$$\boxed{V_2 = 200\ mL}$$

You need to make 0.25 M of NaOH from a 1.0 M solution. What volume should 40 mL be diluted to?

$$C_1 V_1 = C_2 V_2$$

$$[1.0\,M][40\,mL] = [0.25\,M]\,V_2$$

$$V_2 = \frac{(1.0\,M)(40\,mL)}{0.25\,M}$$

$$V_2 = 160\ mL$$

$$\boxed{V_2 = 200\ mL}$$

If you have 50 mL of a 5.0 M $CaCl_2$ solution, how much water is needed to make a 1.0 M solution?

$$C_1V_1 = C_2V_2$$

$$[5.0\,M][50\,mL] = [1.0\,M]\,V_2$$

$$V_2 = \frac{(5.0\,\cancel{M})(50\,mL)}{1.0\,\cancel{M}}$$

$$V_2 = 250\,mL$$

$$\boxed{V_2 = 300\,mL}$$