How would you dilute 0.25 L of a 2.0 M solution to 750 mL?

You have 500 mL of a 6.0 M NaCl solution. What volume (in liters) would give a 2.0 M solution?

Dilute 200 mL of a 3.0 M glucose solution to 1.2 L. What is the final concentration?

You have 1.0 L of a 4.0 M KCl solution. What final volume (in mL) would yield 1.0 M?

You have 0.1 L of a 5.0 M stock. What volume (in mL) will yield 1.0 M?

How would you dilute 0.25 L of a 2.0 M solution to 750 mL?

$$C_1 V_1 = C_2 V_2$$

$$[2.0\,M][0.25\,L] = C_2\,[750\,mL]$$

$$C_2 = \frac{(2.0\,M)(0.25\,\cancel{L})}{750\,\cancel{mL}}\left(\frac{1000\,\cancel{mL}}{1\,\cancel{L}}\right)$$

$$C_2 = 0.66\overline{6}\ M$$

$$\boxed{C_2 = 0.67\ M}$$

You have 500 mL of a 6.0 M NaCl solution. What volume (in liters) would give a 2.0 M solution?

$$C_1 V_1 = C_2 V_2$$

$$[6.0\,M][500\,mL] = [2.0\,M]\,V_2$$

$$V_2 = \frac{(6.0\,M)(500\,mL)}{2.0\,M}$$

$$V_2 = 1500\,mL \left(\frac{1\,L}{1000\,mL}\right)$$

$$V_2 = 1.5\,L$$

$$\boxed{V_2 = 2\,L}$$

Dilute 200 mL of a 3.0 M glucose solution to 1.2 L. What is the final concentration?

$$C_1 V_1 = C_2 V_2$$

$$[3.0\,M][200\,mL] = C_2[1.2\,L]$$

$$C_2 = \frac{(3.0\,M)(200\,\cancel{mL})}{1.2\,\cancel{L}}\left(\frac{1\,\cancel{L}}{1000\,\cancel{mL}}\right)$$

$$C_2 = 0.5\,M$$

$$\boxed{C_2 = 0.5\,M}$$

You have 1.0 L of a 4.0 M KCl solution. What final volume (in mL) would yield 1.0 M?

$$C_1 V_1 = C_2 V_2$$

$$[4.0\,M][1.0\,L] = [1.0\,M]\,V_2$$

$$V_2 = \frac{(4.0\,\cancel{M})(1.0\,\cancel{L})}{1.0\,\cancel{M}} \left(\frac{1000\ mL}{1\,\cancel{L}}\right)$$

$$V_2 = 4000\ mL$$

$$\boxed{V_2 = 4.0 \times 10^3\ mL}$$

You have 0.1 L of a 5.0 M stock. What volume (in mL) will yield 1.0 M?

$$C_1 V_1 = C_2 V_2$$

$$[5.0\,M][0.1\,L] = [1.0\,M]\,V_2$$

$$V_2 = \frac{(5.0\,\cancel{M})(0.1\,\cancel{L})}{1.0\,\cancel{M}} \left(\frac{1000\,mL}{1\,\cancel{L}}\right)$$

$$V_2 = 500\,mL$$

$$\boxed{V_2 = 500\,mL}$$