Day 4 Practice Problem Solutions

① $.35(\text{Total}) = 430$

$$\text{Total} = \frac{430}{0.35}$$

$$\boxed{\text{Total} = 1229 \text{ pomegranates}}$$

② a) 82 mph to km/s

$$82 \frac{\text{miles}}{\text{hour}} \left(\frac{1 \text{ hour}}{60 \text{ min}}\right)\left(\frac{1 \text{ min}}{60 \text{ s}}\right)\left(\frac{1.61 \text{ km}}{1 \text{ mile}}\right) = \boxed{0.03 \frac{\text{km}}{\text{s}}}$$

b) 4500 g/cm^3 to kg/L

remember you have to cube this!

$$4500 \frac{\text{g}}{\text{cm}^3}\left[\frac{\text{kg}}{1000 \text{ g}}\right]\left[\frac{100 \text{ cm}}{\text{m}}\right]^3\left[\frac{1 \text{ m}^3}{1000 \text{ L}}\right]$$

$$= \boxed{4500 \frac{\text{kg}}{\text{L}}}!$$

③ a) $\frac{54 \text{kg}}{1200 \text{ m}^3} = \boxed{0.045 \text{ kg/m}^3}$

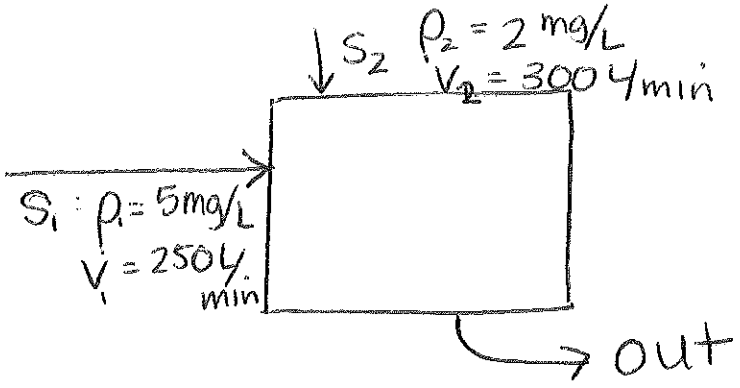
b) $\frac{54 \text{ kg}}{1200 + 1500 \text{ m}^3} = \frac{54 \text{kg}}{2700 \text{ m}^3} = \boxed{0.02 \frac{\text{kg}}{\text{m}^3}}$

↑ must add this much H_2O!

$$\frac{54 \text{ kg}}{1200 + X} = 0.02 \frac{\text{kg}}{\text{m}^3}$$

solve for this volume to get solution of 1500 m^3

(4) a)



b) $\underbrace{\rho_1 V_1 + \rho_2 V_2}_{in} = \underbrace{\rho_3 V_3}_{out}$

for no volume accumulation,

$$V_{out} = 250\ L/min + 300\ L/min$$

$$\boxed{V_{out} = 550\ L/min}$$

Then plug in to find

$$\rho_1 V_1 + \rho_2 V_2 = \rho_{out} V_{out}$$

$$(5\ mg/L)(250\ L/min) + (2\ mg/L)(300\ L/min) = \rho_{out}(550\ L/min)$$

$$1250\ mg/min + 600\ mg/min = \rho_{out}(550\ L/min)$$

$$1850\ mg/min = \rho_{out}(550\ L/min)$$

$$\rho_{out} = \frac{1850\ mg/min}{550\ L/min}$$

$$\boxed{\rho_{out} = 3.36\ mg/L}$$