4) a tank contains 5000L of pure water. Brine that contains 30g of salt per liter of water is pumped into the tank at a rate of 25L/min. Find a function that records the concentration of salt after t minutes (in grams per liter) and then find out what happens to the concentration as $t \rightarrow \infty$

- every min. 25L of the brine is pumped into the tank, and each liter has 30g of salt, therefore $\left[\dfrac{30 \text{ g salt}}{1 \text{ L water}}\right] \times \left[\dfrac{25 \text{ L water}}{1 \text{ min.}}\right]$

    750 g salt/min is being pumped into the tank

- the tank already contains 5000L of pure water and each min (t) 25 L of water is added, therefore $25t + 5000$ L is the amount of water in the tank

- if $f(t)$ = the grams of salt per liter in the tank $f(t) = \dfrac{t \cdot 750 \text{ g salt}}{25t + 5000 \text{ L water}}$

$\lim\limits_{t \to \infty} f(t) \quad \dfrac{t \cdot 750}{25t + 5000} \dfrac{\left(\frac{1}{t}\right)}{\left(\frac{1}{t}\right)} = \lim\limits_{t \to \infty} f(t) \quad \dfrac{750}{25 + \frac{5000}{t}} =$

$\lim\limits_{t \to \infty} f(t) \quad \dfrac{750}{25} = \lim\limits_{t \to \infty} f(t) = 30 \text{ g/L}$ **Great use of dimensional analysis!!**