## Task 1:

1. The objective function in this problem is to maximize the sales revenue generated by the salads and pizzas prepared by the chef.

   The objective function: $20x + 22y$

2. The decision variables in this problem are the quantities of salads ($x$) and pizzas ($y$) that the chef must prepare

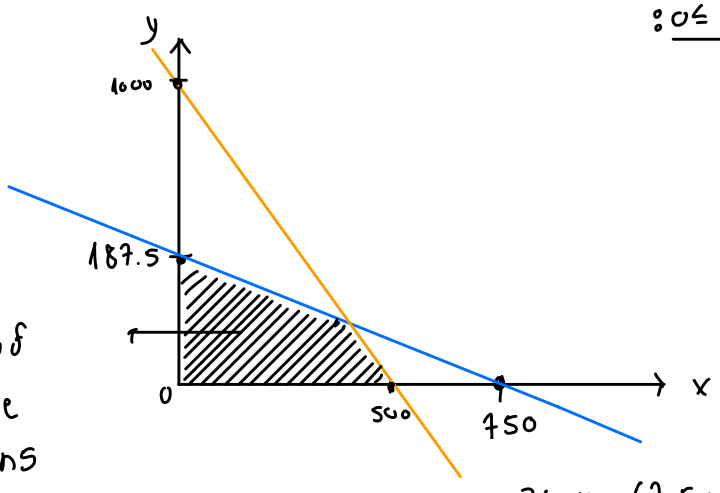
3. a. Cheese constraint: $90x + 360y \leq 67,500$

   b. Tomato constraint: $180x + 90y \leq 90,000$

   c. Non negativity constraint: $0 \leq x$, $0 \leq y$.

## Task 2:

4.




area of feasible solutions

a. $90x + 360y = 67,500$

- $x = 0$: $360y = 67,500 \rightarrow y = 187.5 \rightarrow (0, 187.5)$
- $y = 0$: $90x = 67,500 \rightarrow x = 750 \rightarrow (750, 0)$

b. $180x + 90y = 90,000$

- $x = 0$: $90y = 90,000 \rightarrow y = 1000 \rightarrow (0, 1000)$
- $y = 0$: $180x = 90,000 \rightarrow x = 500 \rightarrow (500, 0)$

5. the Problem's Optimum solution: $\begin{cases} 90x+360y=67,500 \\ 180x+90y=90,000 \end{cases} \xrightarrow{\cdot 2} \begin{cases} 180x+720y=135,000 \\ 180x+90y=90,000 \end{cases}$

$\longrightarrow 630y = 45000 \longrightarrow y = \frac{500}{7} \longrightarrow 180x + 90 \cdot \frac{500}{7} = 90,000 \longrightarrow x = \frac{3250}{7} \longrightarrow \left(\frac{3250}{7}, \frac{500}{7}\right)$

(With the assumption that the number of salads and pizzas can be a fraction. if not, than (464,71))