

2. John is packing books into boxes. Each box can hold either 15 small books or 9 large books. He needs to pack at least 24 boxes and ship at least 270 books. Boxes containing small books cost \$8 to ship. Boxes containing large books cost \$9.60 to ship. He only has \$240 to spend on shipping. Write a system of **FIVE** inequalities to model this situation.

L = # boxes of large books
S = # boxes of small books

$$L \geq 0$$

$$S \geq 0$$

$$15S + 9L \geq 270$$

$$S + L \geq 24$$

$$9.60L + 8S \leq 240$$

Graph this system of inequalities

$$S \geq 0 \quad L \geq 0 \quad \text{these two tell us we are only using the 1st Quadrant}$$

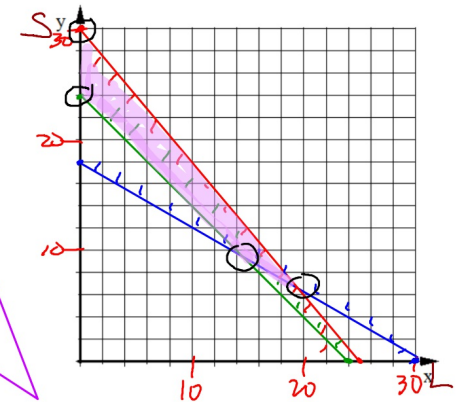
$$9L + 15S \geq 270 \quad \begin{cases} L\text{-int } 30 \\ S\text{-int } 18 \end{cases}$$

$$L + S \geq 24 \quad \begin{cases} L\text{-int } 24 \\ S\text{-int } 24 \end{cases}$$

$$9.60L + 8S \leq 240 \quad \begin{cases} L\text{-int } 25 \\ S\text{-int } 30 \end{cases}$$

Find the coordinates of the corners of the solution region

$$(0, 30) \quad (0, 24) \quad (15, 9) \quad (20, 6)$$



Finding all the intercepts is a way to graph each line. In addition, the largest intercepts for each axis help decide on a scale to use.