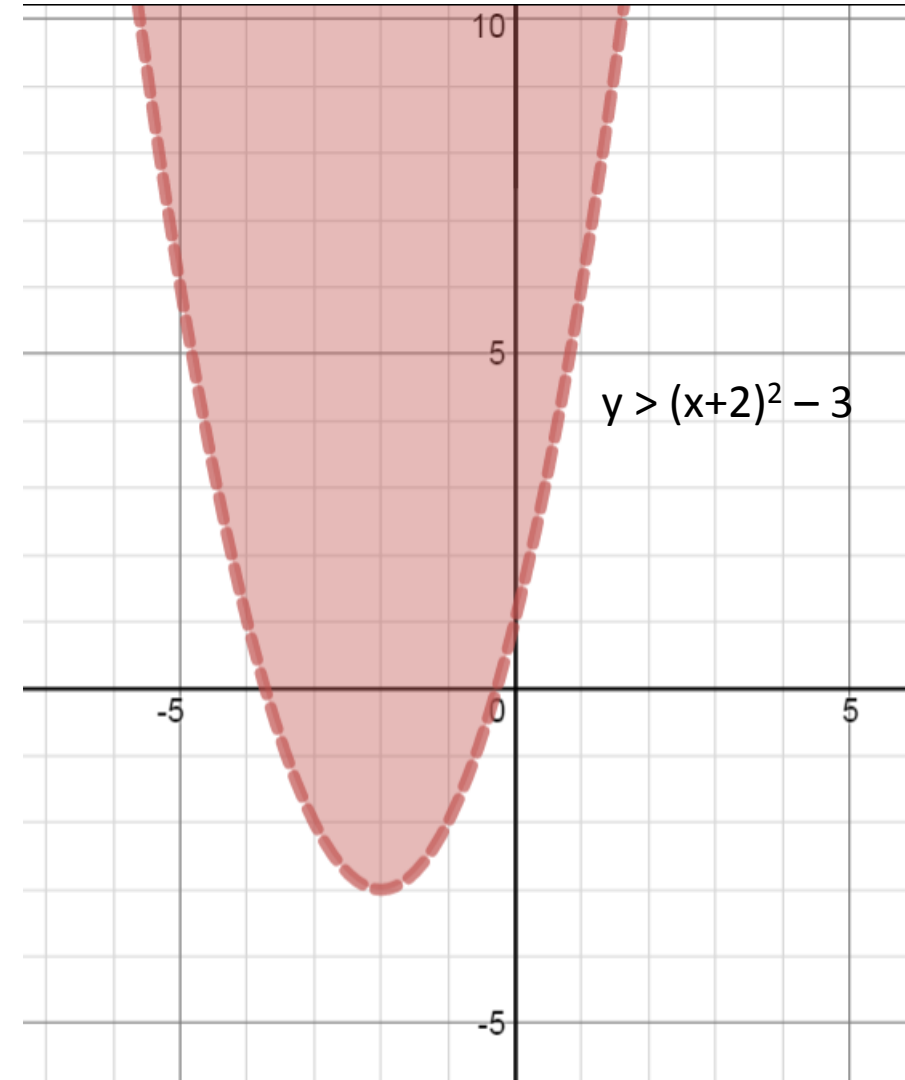


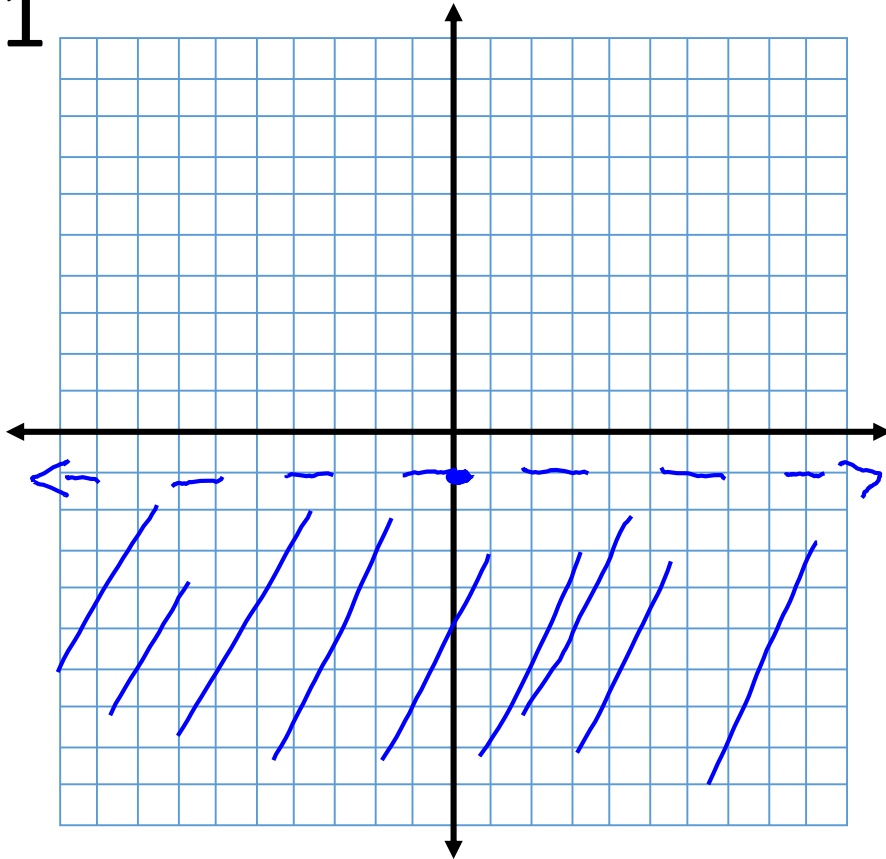
Systems of Inequalities

Section 7.5



Sketch the graph of the inequalities.

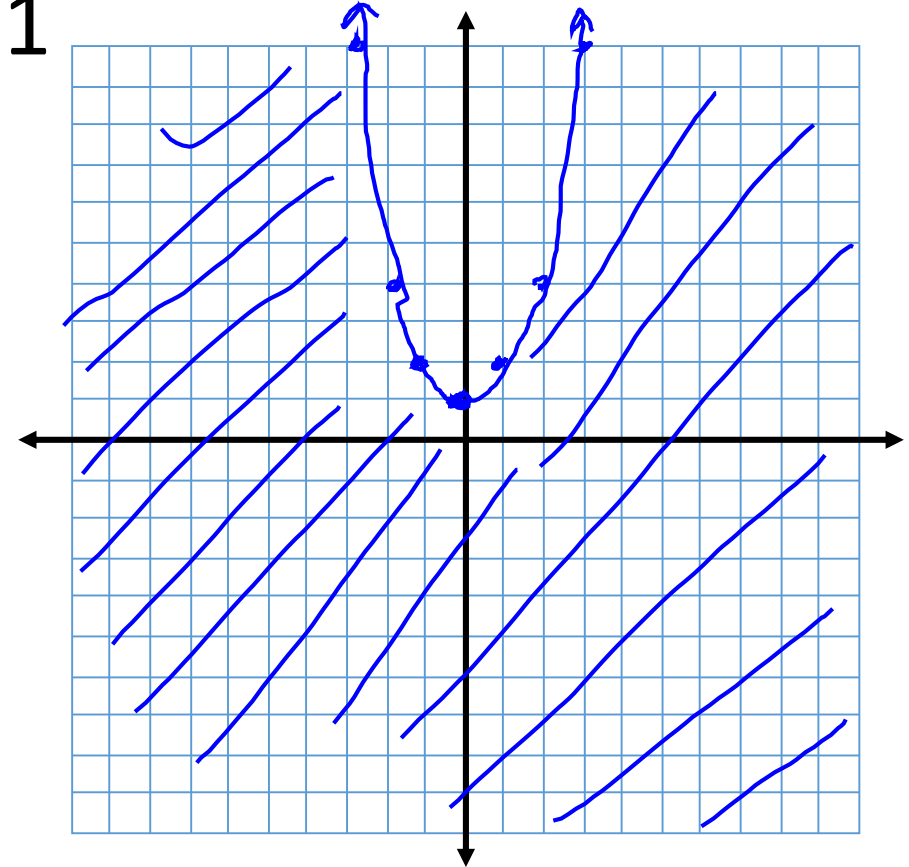
$$y < -1$$



$$(x-0)^2 + 1$$

$$y \leq x^2 + 1$$

$\nearrow (0, 1)$
 $0 \leq 0 + 1$



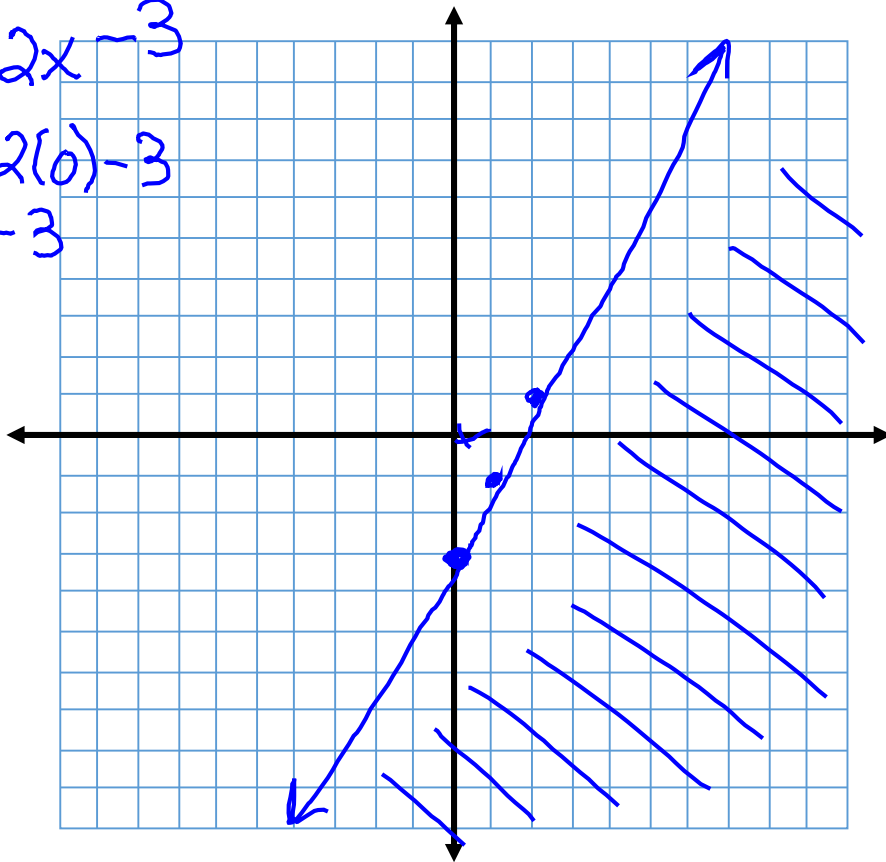
Sketch the graph of the inequalities.

$$2x - y \geq 3$$

$$\begin{array}{r} -2x \\ -y \geq -2x + 3 \\ \hline -y \geq -2x + 3 \\ \hline y \leq 2x - 3 \end{array}$$

$$0 \leq 2(0) - 3$$

$$0 \leq -3$$



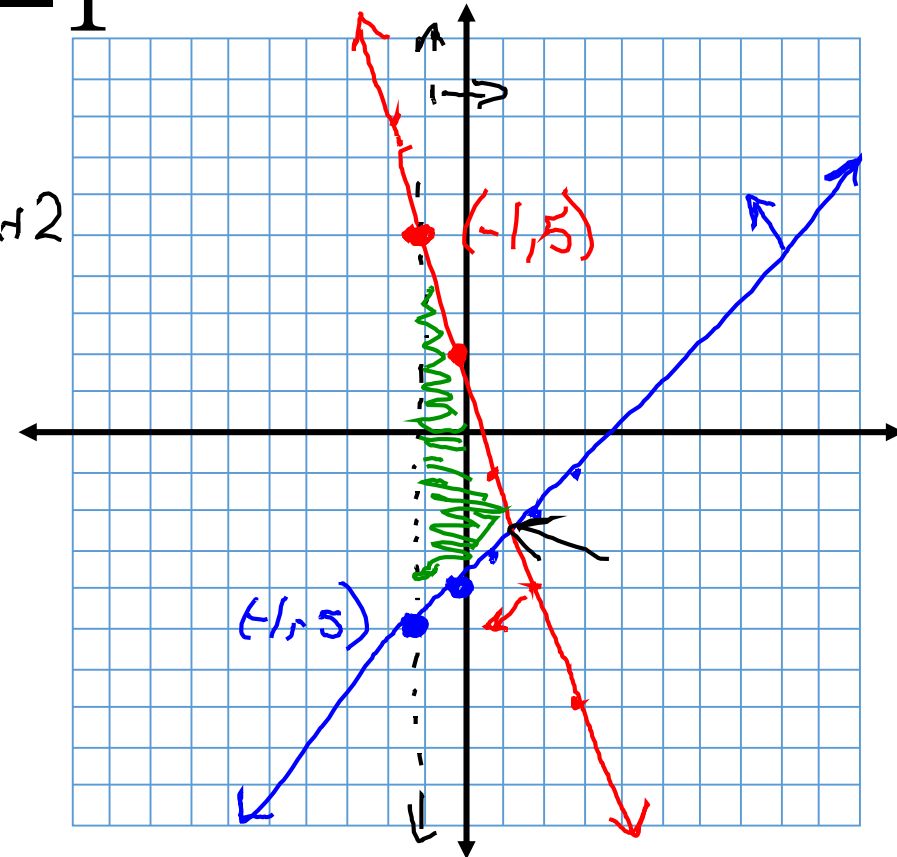
$$\begin{cases} x - y \leq 4 \\ 3x + y \leq 2 \\ x > -1 \end{cases}$$

$$\begin{array}{r} +x + 4 \rightarrow 3x + 2 \\ +3x \\ \hline 4x = -2 \\ x = -\frac{1}{2} \end{array}$$

rule

$$\begin{array}{r} -5y \leq -x + 4 \\ \hline 5y \geq x - 4 \\ y \geq (-1) - 4 \end{array}$$

$$\begin{array}{r} 4 \leq -3x + 2 \\ 4 \leq -3(-1) + 2 \end{array}$$

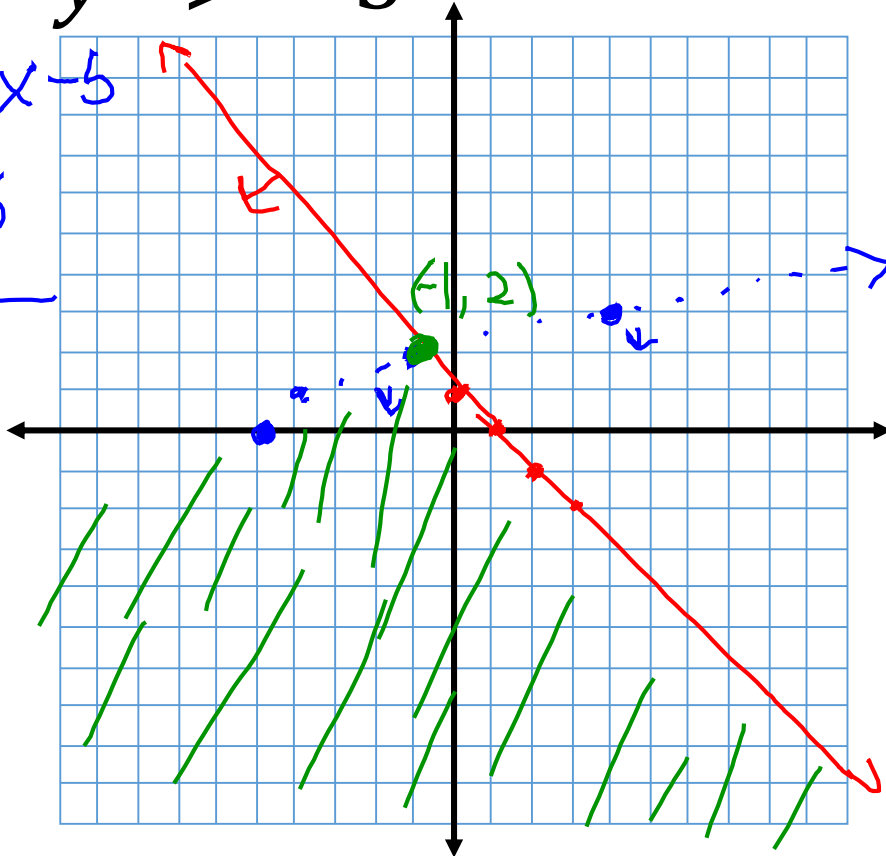


Sketch the graph and label the solutions' vertices.

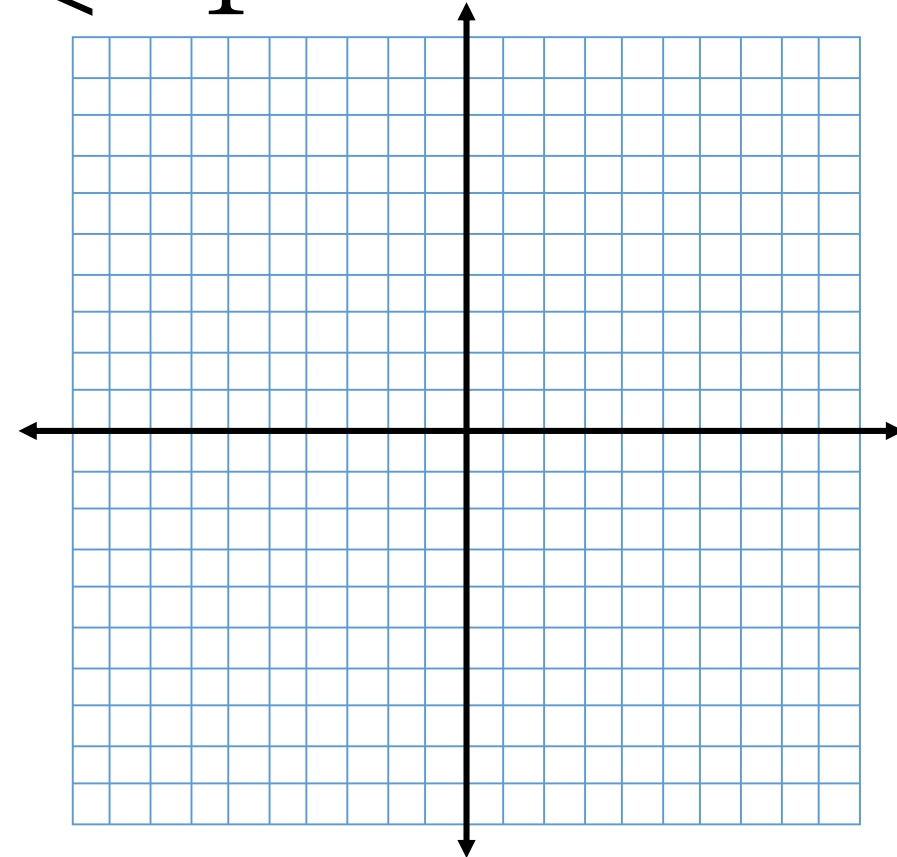
$$y \leq -x + 1$$

$$\begin{cases} x + y \leq 1 \\ x - y^2 > -5 \end{cases}$$

$$\begin{aligned} -y^2 &> -x - 5 \\ y^2 &< x + 5 \\ y &< \sqrt{x + 5} \end{aligned}$$



$$\begin{cases} 3x + y > 2 \\ 3x + y < -1 \end{cases}$$



Consumer and Producer Surplus

The consumer surplus is a measure of the amount consumers would have been willing to pay **above** what they did pay. The producer surplus is the measure **below** what the producer would have been willing to receive for their good or service.

$$81 - .055x = .125x$$

$$\frac{81 - .055x}{+.055x} = \frac{.125x}{+.055x}$$

$$81 = .18x$$

$$x = 450$$

$$p \leq 81 - .055x$$

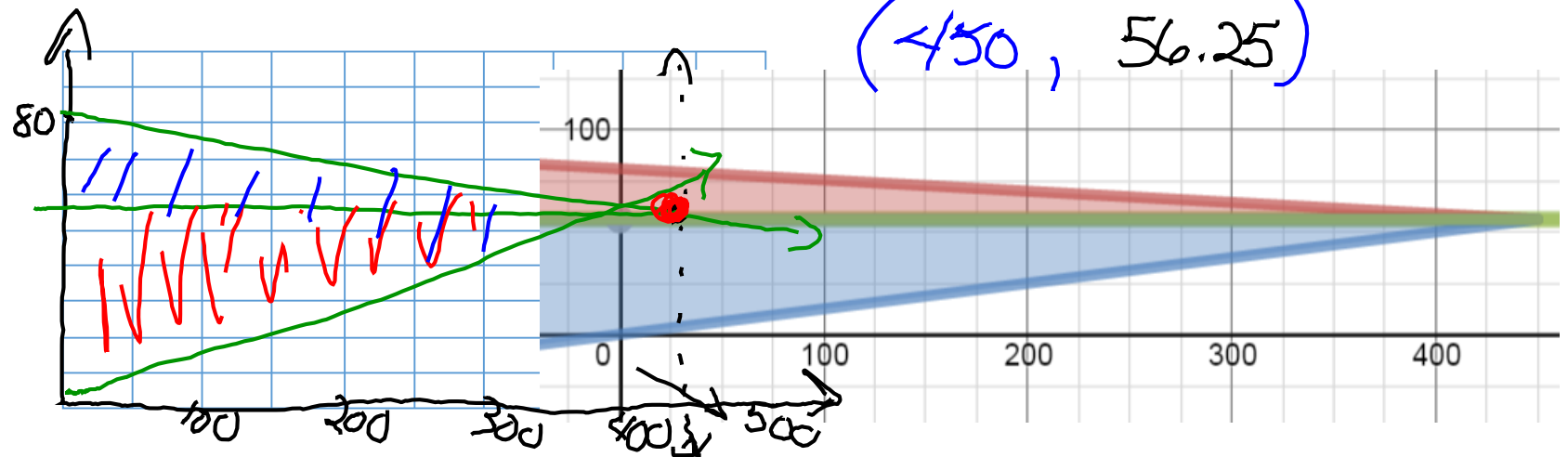
$$p > .125x$$

Find the consumer surplus and producer surplus for the demand and surplus equations.

$$\begin{cases} \text{Producers} & p \leq 81 - .055x \\ \text{Consumers} & p \geq .125x \end{cases}$$

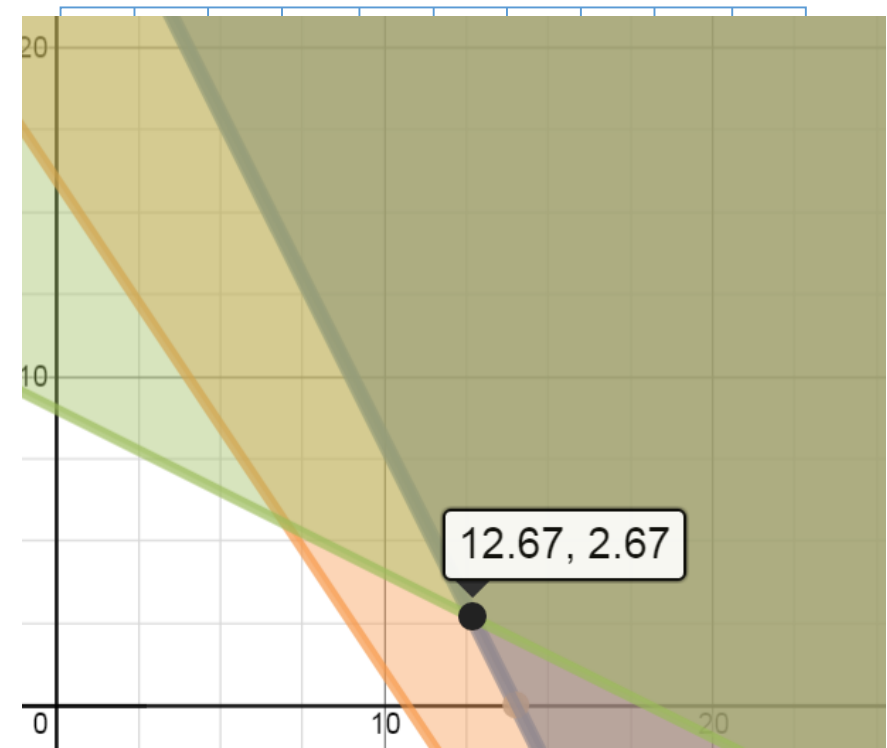
$$p = .125(450)$$

$$(450, 56.25)$$



Nutrition

Design a supplement from food X and food Y. X contains 20 units of calcium, 15 units of iron and 10 of vitamin B per ounce. Food Y has 10 units of calcium, 10 of iron and 20 of vitamin B per ounce. Minimum daily requirements are 280 units of calcium, 160 of iron, and 180 of vitamin B.



Section 7.5 Pg 515: 33-45 x 3's, 63, 70