6. **Health**  Mark Donovan likes to snack frequently during the day, but he wants his snacks to provide at least 24 grams of protein per day. Each Snack-Pack provides 4 grams of protein, and each Minibite provides 1 gram. Snack-Packs cost 50 cents each and Minibites 12 cents. How many of each snack should he use to minimize his daily cost?

\[
\begin{align*}
\text{money spent:} & \quad Z = 0.5x + 0.12y \\
\text{conditions:} & \quad \begin{cases} 
[\text{grams}] \geq 24 \\
4x + y \geq 24 \\
x \geq 0 \\
y \geq 0 
\end{cases}
\end{align*}
\]

\[
y = 0 \quad \text{in} \quad y = 24 - 4x \\
x = 0 \quad \text{in} \quad y = 24 - 4x \\
4x = 24 \\
x = 6
\]

Corners are: \((0, 24), (6, 0)\)

Check \(Z = 0.5x + 0.12y\)

\((0,24): \quad Z = 0.5(0) + 0.12(24) = 2.88 \quad 2.88\)

\((6,0): \quad Z = 0.5(6) + 0.12(0) = 3 \quad 3\)
16. **Business** The manufacturing process requires that oil refineries manufacture at least 2 gallons of gasoline for every gallon of fuel oil. To meet the winter demand for fuel oil, at least 3 million gallons a day must be produced. The demand for gasoline is no more than 12 million gallons per day. It takes .25 hour to ship each million gallons of gasoline and 1 hour to ship each million gallons of fuel oil out of the warehouse. No more than 6.6 hours are available for shipping. If the refinery sells gasoline for $1.25 per gallon and fuel oil for $1 per gallon, how much of each should be produced to maximize revenue? Find the maximum revenue.

\[
\begin{align*}
\text{maximize:} & \quad Z = F + 1.25G \\
\text{subject to:} & \quad G \geq F \\
& \quad F \geq 3 \\
& \quad G \leq 12 \\
& \quad 0.25G + F \leq 6.6 \\
\end{align*}
\]

\[
\begin{array}{c|cc}
F & G & \frac{1}{4}G + F \leq 3 \frac{3}{5} \\
\hline
4 & 10.4 & 14.4 \\
6 & 2.4 & 6F \leq 26.4 \\
\end{array}
\]

- \( A = (3, 12) \)
- \( B \) is the intersection of \( G = 12 \) with \( G = -4F + 26.4 \)
- \( C \) is the intersection of \( G = 2F \) and \( G = -4F + 26.4 \)

\[
\begin{align*}
A & = (3, 12) \\
B & = (3.6, 12) \\
C & = (4.4, 8.8) \\
\end{align*}
\]
0 = intersection of \( G = 2F \) and \( F = 3 \)
0 = (3, 6).

Check \( z = F + 1.25G \) at
\[ A = (3, 12) \rightarrow z = 3 + 1.25 \cdot 12 = 18 \]
\[ B = (3.6, 12) \rightarrow z = 3.6 + 1.25 \cdot 12 = 18.6 \checkmark \]
\[ C = (4.4, 8.8) \rightarrow z = 4.4 + 1.25 \cdot 8.8 = 15.4 \]
\[ D = (3, 6) \rightarrow z = 3 + 1.25 \cdot 6 = 10.5 \]

3.6 million gallons of fuel oil and 12 million gallons of gasoline, which sells for 18.6 million dollars.