7.6 Systems of Linear Inequalities Word Problems

Goal:
Use a system of linear inequalities to model a real-life situation.
Word Problems

- Most of these problems will not give you a slope and y-intercept.

- You will not be writing inequalities in Slope-Intercept Form.

- You will be writing equations in Standard Form.
Standard Form Word Problems

• Figure out what $x$ and $y$ represent.

• Write an inequality for each topic in the problem.
Word Problem #1

You can work a total of no more then 41 hours each week at your two jobs. Housecleaning pays $5 per hour and your sales job pays $8 per hour. You need to earn at least $254 each week to pay your bills. Write a system of inequalities that shows the various numbers of hours you can work at each job.

x = housecleaning
y = sales job

Hours: $x + y \leq 41$
Money: $5x + 8y \geq 254$
Word Problem #2

Fuel x costs $2 per gallon and fuel y costs $3 per gallon. You have at most $18 to spend on fuel. Write and graph a system of linear inequalities to represent this situation.

\[
\begin{align*}
x &= \text{fuel x} \\
y &= \text{fuel y} \\
\text{Price:} & \quad 2x + 3y \leq 18 \\
\text{Gallons of x:} & \quad x \geq 0 \\
\text{Gallons of y:} & \quad y \geq 0
\end{align*}
\]
Word Problem #3

A salad contains ham and chicken. There are at most 6 pounds of ham and chicken in the salad. Write and graph a system of inequalities to represent this situation.

\[ x = \text{ham} \]
\[ y = \text{chicken} \]

Total Pounds: \[ x + y \leq 6 \]
Pounds of ham: \[ x \geq 0 \]
Pounds of chicken: \[ y \geq 0 \]
Word Problem #4

Mary babysits for $4 per hour. She also works as a tutor for $7 per hour. She is only allowed to work 13 hours per week. She wants to make at least $65. Write and graph a system of inequalities to represent this situation.

\[ x = \text{babysitting} \]
\[ y = \text{tutoring} \]

Hours: \[ x + y \leq 13 \]
Money: \[ 4x + 7y \geq 65 \]