

Identifying Constraints and Interpreting Solutions

Name _____ Class Period _____

Constraints in Decision Making - Larry's Labor Day Bash

Larry is planning a huge Labor Day party that he does every year for his friends and family. He has \$100 set aside to spend on food for the party. He is trying to decide how many pounds of chicken to buy and how many steaks to buy. The chicken sells for \$2 a pound, while the steaks sell for \$5 per steak.

1. Write an equation using 2 variables to represent Larry's purchasing decision.
Use c = pounds of chicken and s = number of steaks

$$2c + 5s = 100$$

2. Use your equation to figure out how many steaks he can buy if he gets 20 pounds of chicken.

$$\begin{array}{r} 2(20) + 5s = 100 \\ 40 + 5s = 100 \\ \underline{-40} \quad \underline{-40} \\ 5s = 60 \\ \frac{5s}{5} = \frac{60}{5} \\ s = 12 \text{ steaks} \end{array}$$

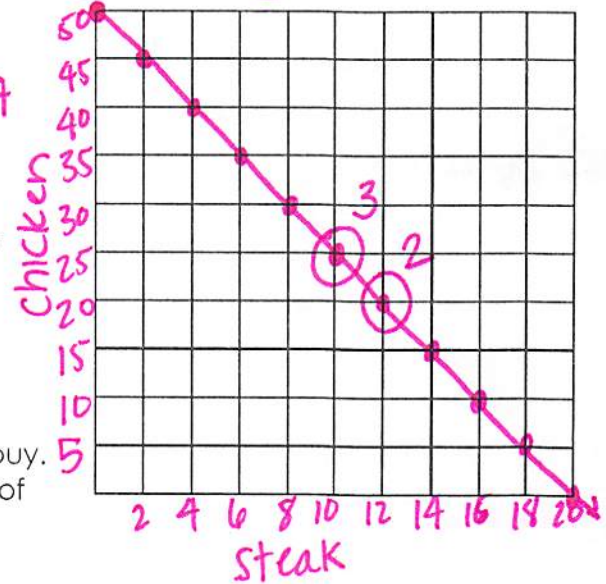
3. How many pounds of chicken can he get if he buys 10 steaks?

$$\begin{array}{r} 2c + 5(10) = 100 \\ 2c + 50 = 100 \\ \underline{-50} \quad \underline{-50} \\ 2c = 50 \\ \frac{2c}{2} = \frac{50}{2} \\ c = 25 \text{ lb of chicken} \end{array}$$

4. Solve your equation (from #1) in terms of the pounds of chicken, c .

$$\begin{array}{r} 2c + 5s = 100 \\ \underline{-5s} \quad \underline{-5s} \\ 2c = 100 - 5s \rightarrow \frac{2c}{2} = \frac{100 - 5s}{2} \rightarrow c = 50 - \frac{5}{2}s \end{array}$$

5. Graph the equation you just came up with in problem #4.



6. Find the minimum and maximum pounds of chicken he can buy. Write your answer as an inequality in terms of c , the pounds of chicken.

min: 0 max: 50
 $0 \leq c \leq 50$

7. Find the minimum and maximum number of steaks he can buy. Write your answer as an inequality in terms of s , the number of steaks.

min: 0 max: 20

8. Identify the points representing your answers to problems 2 and 3 on your graph.

② 20 chicken 12 steak $(12, 20)$ ③ 10 steaks 25 chicken $(10, 25)$