

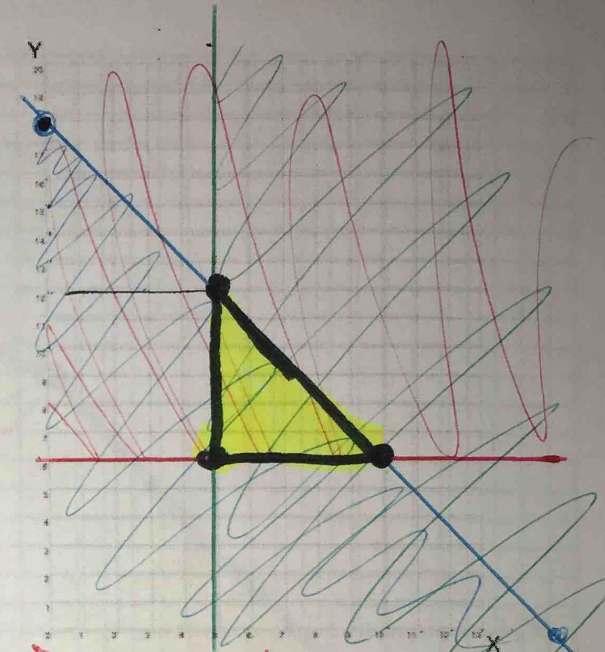
1. Katie is a sales representative whose territory is Alaska and Nebraska. Her daily travel expenses average \$120 in Alaska and \$100 in Nebraska. She receives an annual travel allowance of at most \$18,000. She must spend at least 50 days in Alaska. She must spend at least 60 days in Nebraska. If sales average \$3000 per day in Alaska and \$2800 per day in Nebraska, how many days should she spend in each state to maximize sales?

let  $x = \#$  days in Alaska  
 let  $y = \#$  days in Nebraska

$$\begin{cases} 120x + 100y \leq 18000 \\ x \geq 50 \\ y \geq 60 \end{cases}$$

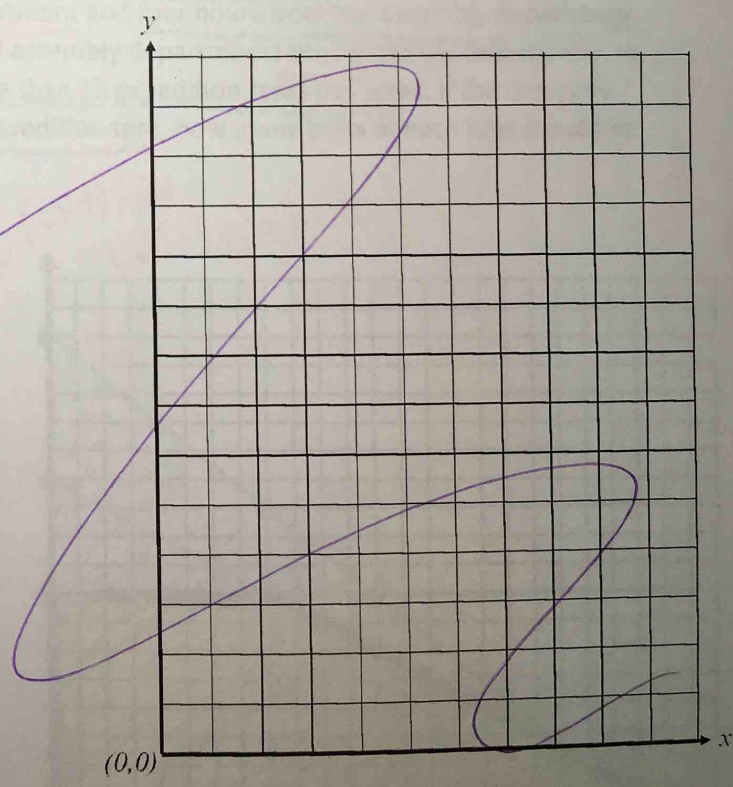
$P = 3000x + 2800y$

- $(50, 60)$  318,000
- $(50, 120)$  486,000
- $(100, 60)$  468,000



Should spend 50 days in Alaska & 120 days in Nebraska

2. The CHICKEN 63.8 radio station has advertising time to sell. You want to advertise a sale at your candy store. In the morning, a 60 second ad costs \$200. In the evening, a 60 second ad costs \$50. Your candy store has at most \$2250 to spend. You will run at most 20 ads. A morning ad will be heard by 90,000 people, and an evening ad will be heard by 30,000 people. You want your ads to reach the most listeners.



3. Carrie's workers make sweaters that sell for \$55 each. They also make dresses that sell for \$85 each. They can produce at most 18 finished objects per day. Each sweater requires 20 hours of labor, while a dress requires 40 hours of labor. A maximum of 600 hours of labor is available each day. Carrie needs to maximize the amount of money she takes in.

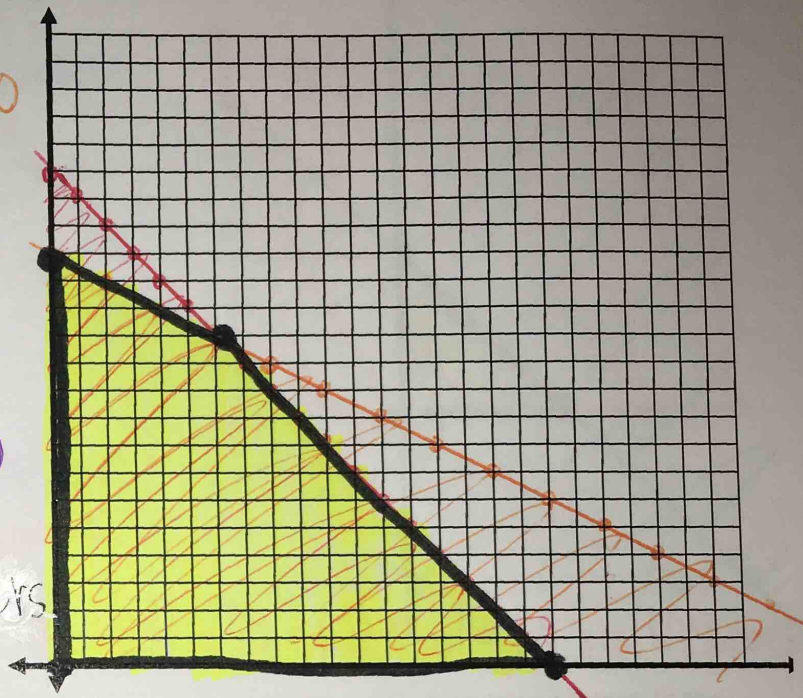
let  $x = \#$  of sweaters  
 $y = \#$  of dresses

$$\begin{cases} x + y \leq 18 \\ 20x + 40y \leq 600 \\ x \geq 0 \\ y \geq 0 \end{cases}$$

$$P = 55x + 85y$$

$(0,0)$	$(0,15)$	$(6,12)$	$(18,0)$
\$0	\$1275	\$1350	\$990

She should make 6 sweaters & 12 dresses



4. A manufacturer of a lightweight mountain tent makes a standard model and an expedition model. Each standard tent requires one labor hour from the cutting department and three labor hours from the assembly department. Each expedition tent requires two hours labor from the cutting department and four hours from the assembly department. The maximum labor hours available per week in the cutting and assembly departments are 32 and 84, respectively. In addition, the distributor, because of demand, will not take more than 12 expedition tents per week. If the company makes a profit of \$50 on each standard tent and \$80 on each expedition tent, how many tents of each type should be manufactured each week to maximize the weekly profit?

let  $x = \#$  standard tents  
 $y = \#$  expedition tents

$$\begin{cases} x + 2y \leq 32 \text{ (cutting constraints)} \\ 3x + 4y \leq 84 \text{ (assembly constraint)} \\ y \leq 12 \\ x \geq 0 \end{cases}$$

$$P = 50x + 80y$$

$(0,12)$	$(8,12)$	$(20,6)$	$(28,0)$
\$960	\$1360	\$1480	\$1400

20 standard model tents, 6 expedition tents

