

Linear Programming  
Problem #1

2018

Name \_\_\_\_\_  
Date \_\_\_\_\_

Linear Programming Problem number 2  
( Keep all these so you have a finished portfolio)

### Picturing pictures:

Joe is an artist who specializes in geometric designs. He is trying to get ready for a street fair next month.

Joe paints both watercolors and pastels. Each type of picture takes him about the same amount of time to paint. He figures he has time to do a total of **AT MOST** 16 pictures. The materials for each pastel will cost him \$5, and the materials for each watercolor will cost him \$15. He has \$180 to spend on materials. He makes a profit of \$40 on each pastel and a profit of \$100 on each watercolor.

- 1) Choose variables to represent the amount of each pastel and watercolor that he makes.
- 2) Use your organizational chart to write a system of inequalities.
- 3) Make the graph to show the feasible region that satisfy the constraints.
- 4) Test 5 different sets of points into your profit equation(  $40p+100w$ ) and see if you can find one that produces the most profit.

2) Suppose he thought that \$1,000 would be a great profit. Find three different combinations of points from your feasible region that would produce \$1,000.

3) Now suppose he only wanted to make \$500 in profit. Find three different combinations of watercolors and pastels that would earn a profit of \$500.

What do you think he should make if he wants to make the most profit?

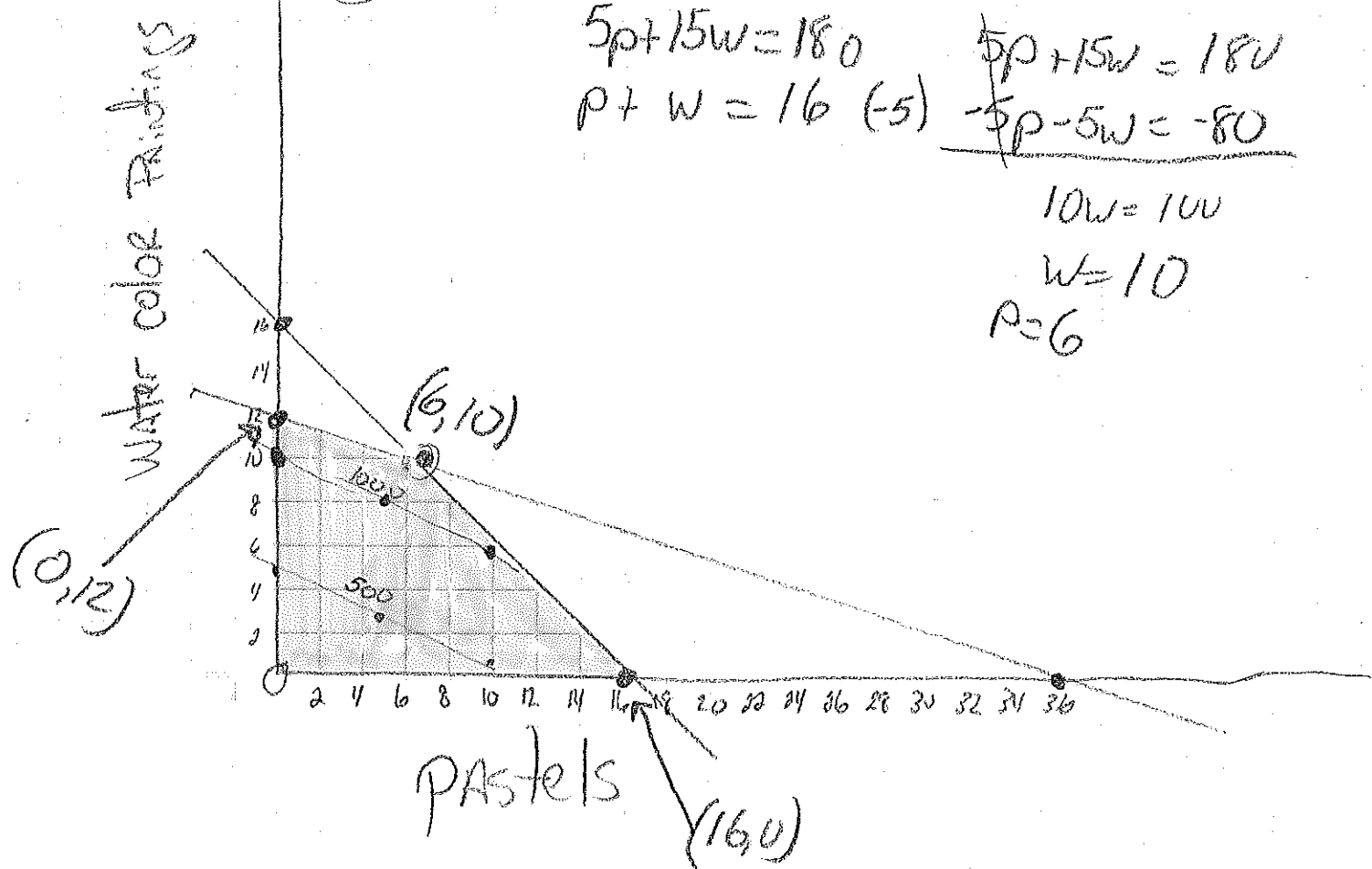
He has a feeling that there will be a big demand for his work. He decides to change his profit to \$50 on a pastel and \$175 on a watercolor. Find some combinations of points that give a profit of \$700

What is the most money that he can make \_\_\_\_\_

Corner Points	$40P + 100W$	Profit
(0,0)	$40(0) + 100(0)$	\$0
(0,12)	$40(0) + 100(12)$	1200
(6,10)	$40(6) + 100(10)$	\$1240
(16,0)	$40(16) + 100(0)$	\$640

He should make 6 pastels and 10 watercolors

$$\begin{aligned}
 5P + 15W &= 180 \\
 P + W &= 16 \quad (-5) \\
 \hline
 -5P - 5W &= -80 \\
 10W &= 100 \\
 W &= 10 \\
 P &= 6
 \end{aligned}$$



$$\begin{aligned}
 5P + 15W &\leq 180 \\
 P + W &\leq 16
 \end{aligned}$$

Constraints

(36,0) (0,12)  
(16,0) (0,16)

	Profit
(6,12)	\$2100
(6,10)	2050
(16,0)	800