Date _____

9.4 Graphical Solution of Linear Programming

FM.O.2 Use geometric and algebraic techniques to solve optimization problems with and without technology.
PS.1 Make sense of problems and persevere in solving them.

Graphical Solution - _____

_____

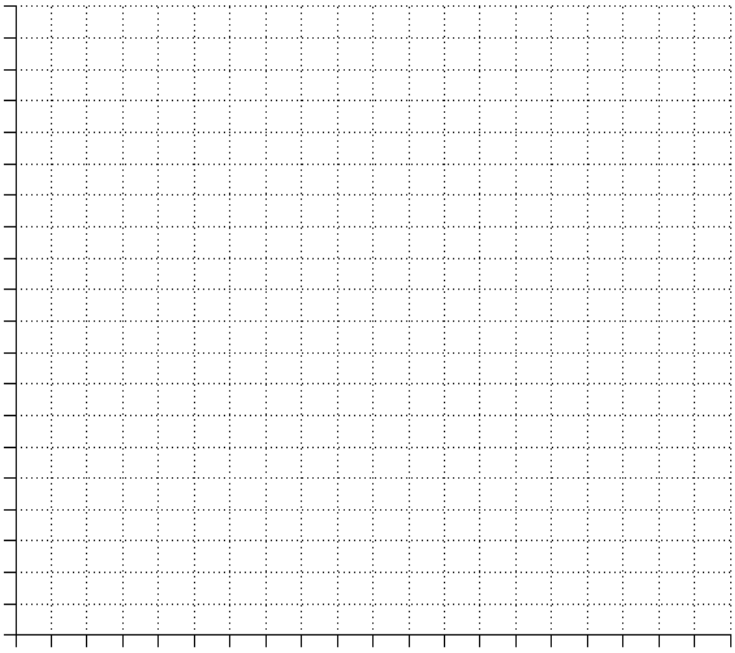
Objective Function - _____

Constraint - _____

Ex. 1 Maximize $P = 3x + 2y$ subject to $2x + 3y \leq 12, 2x + y \leq 8, x \geq 0, y \geq 0$.

Step 1: Graph the Inequalities

Step 2: List the corners of graph and substitute points into function.



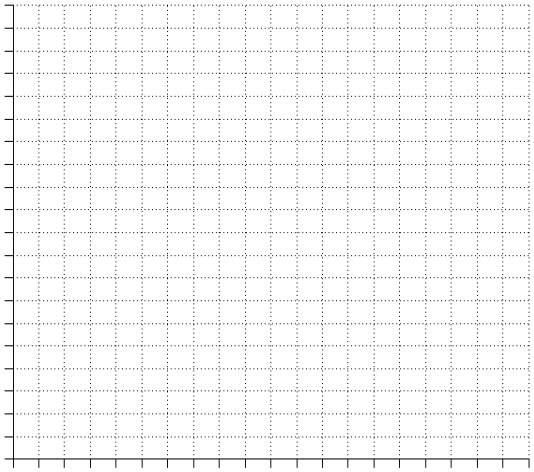
Step 3: Determine the Maximum

Date _____

Ex. 1 Minimize $C = 3x + 4y$ subject to $x + y \geq 3,\ x + 2y \geq 4,\ x \geq 0, y \geq 0$.

Step 1: Graph the Inequalities

Step 2: List the corners of graph and substitute points into function.



Step 3: Determine the Minimum

Ex. 3 Ace Novelty wishes to produce two types of souvenirs: type A and type B. Each type-A souvenir will result in a profit of $1, and each type-B souvenir will result in a profit of $1.20. To manufacture a type-A souvenir requires 2 minutes on machine I and 1 minute on machine II. A type-B souvenir requires 1 minute on machine I and 3 minutes on machine II. There are 3 hours available on machine I and 5 hours available on machine II for processing the order. How many souvenirs of each type should Ace make in order to maximize its profit?

Let *x* be the number of type-A souvenirs sold and let *y* be the number of type-B souvenirs sold. Graph the inequalities and find the maximum profit.

$P = x + 1.2y$
$2x + y \leq 180$
$x + 3y \leq 300$
$x \geq 0$
$y \geq 0$