

(20 pts) NAME (printed neatly): _____

Quiz Grade: _____

1. A large clay pot requires 85 units of clay and 5 labor-hours to produce. A small decorative clay pot requires 14 units of clay and 11 labor-hours to produce. Due to warehouse space, no more than 622 large clay pots and no more than 950 small clay pots can be produced. There are only 12,250 labor-hours and 61,200 units of clay available. If the profit a large clay pot is \$32 and a small clay pot is \$5, how many of each type should be produced and sold to maximize profit?

a. (6 pts) Define your variables x and y , where x is related to large clay pots.

x = number of large clay pots

y = number of small clay pots

b. (18 pts) Set up the linear programming problem.

Maximize $P = 32x + 5y$

Subject to

$$85x + 14y \leq 61200$$

$$5x + 11y \leq 12250$$

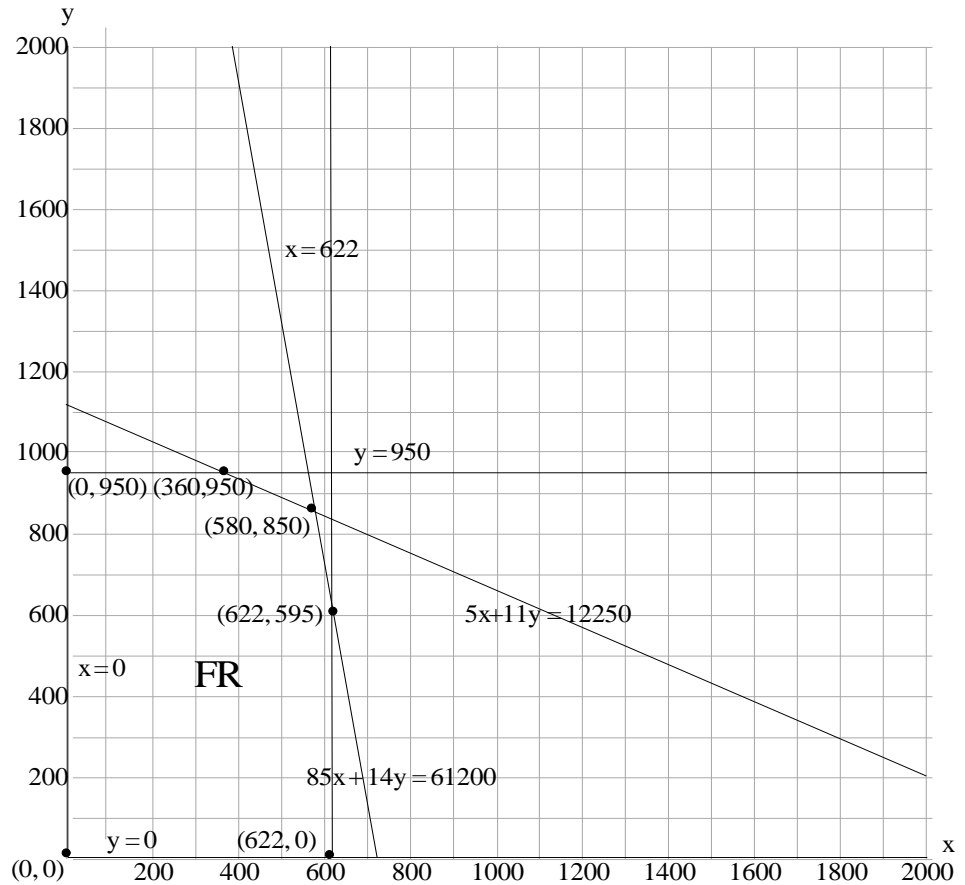
$$x \leq 622$$

$$y \leq 950$$

$$x \geq 0$$

$$y \geq 0$$

c. (22 pts) Graph the constraints, label the lines, label the corner points of the feasible region, and label the feasible region **FR**.



d. (16 pts) Show your work to solve this linear programming problem.

Corner	$P = 32x + 5y$
$(0, 0)$	0
$(0, 950)$	4750
$(360, 950)$	16270
$(580, 850)$	22810
$(622, 595)$	22879 max
$(622, 0)$	19904

e. (12 pts) Write a sentence that gives the solution to this linear programming problem by including all critical information.

A maximum profit of \$22,879 is obtained when 622 large clay pots and 595 small clay pots are produced and sold.

f. (6 pts) Discuss leftovers.

$85 \cdot 622 + 14 \cdot 595 = 61200$	$61200 - 61200 = 0$	no leftover units of clay
$5 \cdot 622 + 11 \cdot 595 = 9655$	$12250 - 9655 = 2595$	2595 labor-hours leftover