Instructor: Prof. A. Suciu   Name: _____

MTH 1101 — QUIZ 2 — FALL 1996

Instructions: Put your name in the blanks above. Put your final answers to each question in the designated spaces on these test pages. Show your work—if there is not enough room, use the back of the page.

1) SOLVE the following linear programming problem. Be sure to shade in the feasible set, and mark down its corners.

Find the maximum and minimum values of $F = 5x + 3y$, subject to the constraints
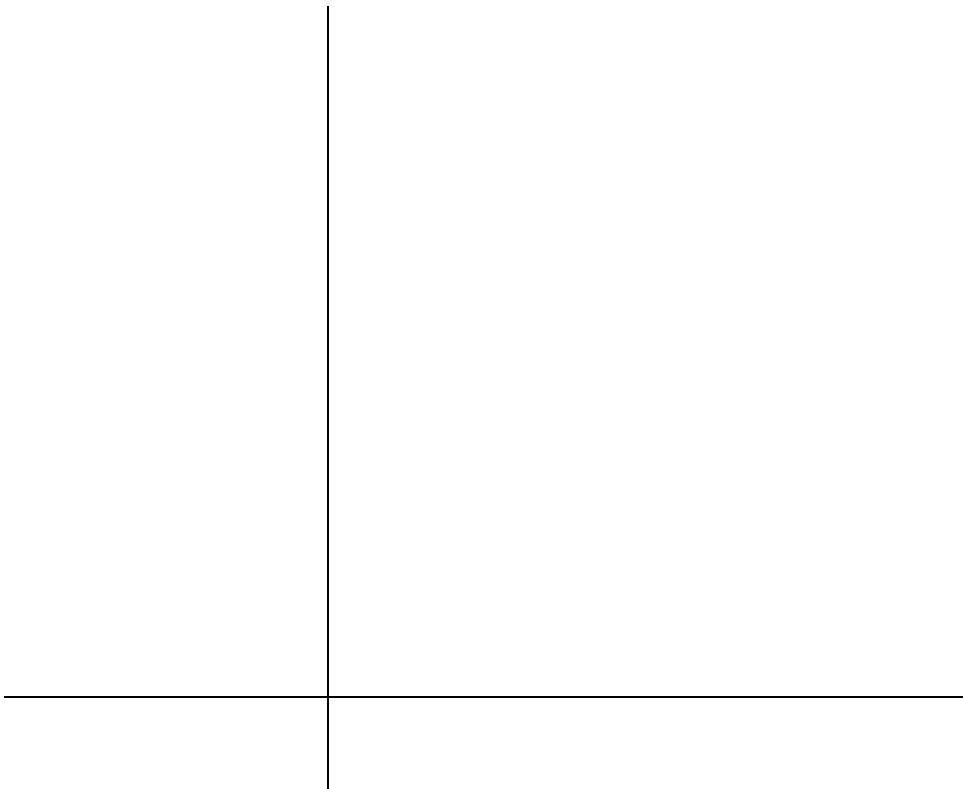
$$x \geq 0, \qquad\qquad y \geq 0,$$
$$x \leq 4, \qquad\qquad x + y \geq 3, \qquad\qquad -x + y \leq 4.$$

Answer:

The maximum value of F equals _____, and it occurs at the point (_____ , _____).

The minimum value of F equals _____, and it occurs at the point (_____ , _____).

2) SET UP a linear program to solve the following problem. Be sure to identify the action variables, **ALL** the constraints, and the objective function. **DO NOT SOLVE**.

A small generator burns two types of fuel—low sulfur and high sulfur—to produce electricity. For each hour of use, each gallon of low sulfur emits 3 units of sulfur dioxide, generates 4 kilowatts of electricity, and costs \$1.30, while each gallon of high sulfur emits 4.5 units of sulfur dioxide, generates 5 kilowatts of electricity, and costs \$1.15. The EPA insists that the maximum amount of sulfur dioxide that may be emitted per hour is 16 units. Suppose that at least 15 kilowatts must be generated per hour to meet demand. How many gallons of low sulfur and how many gallons of high sulfur should be used hourly in order to minimize the cost of the fuel used?