This is a 15 minute quiz, worth 6% and marked out of 6 points. The total possible points awarded for each question is given in square brackets at the beginning of each question. Anything that can fit on one side of an $8\frac{1}{2}$ by 11 inch piece of paper may be used as a reference during this quiz. A calculator and appropriate statistical tables may also be used. No other aids are permitted.

Name (please print): ———————————————————— . **ID Number:** ———— .

                               last   first

---

1. Consider the following linear program.

$$
\begin{array}{rcrcrcr}
\text{maximize} & 2x & + & 5y & & & \\
& 4x & + & y & \leq & 40 \\
& 2x & + & y & \leq & 30 \\
& x & + & 3y & \leq & 30 \\
& x & & & \geq & 0 \\
& & & y & \geq & 0
\end{array}
$$

(a) [2] Use LINPROG to determine the four vertices of the feasible region:

(————, ————), (————, ————), (————, ————), (————, ————).

(b) [1] The optimal solution is at

$(x, y) = ($ ————, ———— $),$

where the objective function is a maximum with value ————

2. A farmer has 150 acres of land suitable for cultivating crops A and B. The cost of cultivating crop A is \$30/acre, whereas that of crop B is \$60/acre. The farmer has a maximum of \$7400 available for land cultivation. Each acre of crop A requires 40 hours of labor, and each acre of crop B requires 25 hours of labor. The farmer has a maximum of 3300 hours of labor available. If he expects to make a profit of \$120/acre on crop A and \$200/acre on crop B, how many acres of each crop should he plant in order to maximize his profit?

(a) [1] The objective function is: ————————————————————.

(b) [2] The constraints are:

    and $x \geq 0$ and $y \geq 0$.

(c) [1] The optimal solution is at

$(x, y) = ($ ————, ———— $),$

where the objective function is a maximum with value ————

(a) [1] The objective function is: *maximize P = 150x + 200y*

(b) [2] The constraints are:

$$
\begin{array}{rcrcl}
x & + & y & \leq & 150 \\
40x & + & 60y & \leq & 7400 \\
40x & + & 25y & \leq & 3300
\end{array}
$$

and $x \geq 0$ and $y \geq 0$.

(c) [1] Using LINPROG, $(x, y) = (7.89, 119.39)$, \$24,824.24