**Linear Programming Maximization Assignment**

*Anderson Cell Phone Company*

Anderson Cell Phone Company has started cell phone production. It produces smart phones and standard phones. Initially, they hired 10 workers for the assembly line. The workers are paid for 8 hours per day. However, they spend only 7 hours assembling the phones because of a 30-minute lunch break and two 15-minute breaks. A smart phone takes 2.5 minutes to assemble and a standard phone takes 1.5 minutes to assemble. The company receives a delivery of 2000 LCD screens per day from its supplier. Profit margins for a smart phone and a standard phone are $40 and $30, respectively. Anderson Company is interested in determining the product mix that gives them the highest daily profit.

1. Define the **decision variables** for the problem.

$$x\_{1}:$$

$$x\_{2}:$$

1. Use the decision variables to define the **objective function**.

$$z=$$

1. Use the decision variables to define all **constraints**.

*Assembly constraint:*

*Screen constraint:*

 *Non-negativity constraints:*

1. Graph the feasible region.

*You will need to solve the constraint inequalities for* $x\_{2}$(similar to how you would solve an equation for *y* before graphing it):

Solve the assembly constraint for $x\_{2}$:

Solve the screen constraint for $x\_{2}$:

$$x\_{1}$$

$$ 1,000$$

$$x\_{2}$$

$$ 2,000$$

$$ 200$$

$$ 1,000$$

$$ 2,000$$

$$ 3,000$$

$$ 3,000$$

$$ 200$$

1. Use the “trace” button on your calculator to identify the corner points of the feasible region.
2. Calculate the profit at each corner point.
3. Determine which corner point yields the highest profit.
4. Interpret the optimal solution in the context of the problem.

*Taking into account \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

*\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ constraints, Anderson Company should produce \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to earn the most daily profit.*