Problem

Games and More Co. produces both video and DVD game players. Each video player, Gamer Gallery, requires 1.5 hours for assembly and 0.25 hours for testing. Each DVD player, Major Player, requires 1 hour for assembly and 0.5 hours for testing.

Each month, the Games and More manufacturing plant has 45,000 available hours for product assembly and 20,000 available hours for product testing.

Games and More Co. earns $60 profit from each Gamer Gallery and $75 profit from each Major Player that it sells.

How many of each type of player should Games and More Co. produce in order to obtain the greatest monthly profit? You can use linear programming to solve this manufacturing problem.

Let *x* be the number of Gamer Gallery players, and let *y* be the number of Major Players.

- Write an expression that represents the profit earned from selling the two different players. This is called an objective function.

    $P(x, y) =$

- Determine the profit that would be earned if 50 Gamer Gallery players and 100 Major Players were sold.

- Write a system of inequalities that represents the constraints for the problem.

    Assembly time constraint:

    Testing time constraint:

    Non-negative number of Major Player and Gamer Gallery players:

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- Solve the assembly and testing time constraints for *y*. Copy the non-negative constraints below to list all constraints.

Enter the inequalities from page 1.9 on page 1.11. Press ⌜tab⌝ to display the entry line. Use the ⌜del⌝ key to delete the equals sign and replace it with an inequality sign from the symbol palette.

Use **Menu > Graph Entry/Edit > Equation > Line > x = c** to enter the line *x* = 0.

- Find the vertices of the feasible region. Use the **Intersection** tool (**Menu > Geometry > Points and Lines > Intersection Point(s)**) to make a point at each vertex. Then use the **Coordinates and Equations** tool (**Menu > Actions > Coordinates and Equations**) to display the coordinates of the vertices.

- Substitute each of the coordinates into the objective function from page 1.5.

    P(*x*, *y*) =

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- Based on these results, how many of each type of player results in the maximum monthly profit for Games and More Co.? What is the maximum possible monthly profit?

    Gamer Gallery Players:

    Major Players:

    Maximum Monthly Profit: