Name: _____ Date: _____ Course: _____

Lesson Problem Statement Answer Key

Lesson problem statement: Your objective is to place some pencils in a tray such that they are stable. This means that you must align the long axes of the pencils with the groove in the tray. You know that a golf pencil (x) is 3.5-inches long and a regular pencil (y) is 7.5-inches long. The tray has room for no more than 52.5 linear inches of pencils (the groove is 52.5 inches long). **Question:** How many of each pencil should you use in order to maximize the total number of pencils in the tray?

1. Inequalities to graph are:

    $x \geq 0$

    $y \geq 0$

    $y \leq -\dfrac{7}{15}x + 7$

2. The corner points of the shaded region are:

    (0,0)

    (15,0)

    (0,7)

3. The optimization equation is:

    $z = x + y$

4. The values of the optimization equation at each corner point are:

    $z(0,0) = 0 + 0 = 0$

    $z(15,0) = 15 + 0 = 15$

    $z(0,7) = 0 + 7 = 7$

5. The maximum value is:

    $z(15,0) = 15$

6. The final solution is:

    15 golf pencils and 0 regular pencils