Activity 4
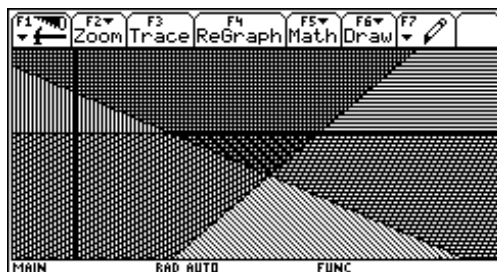## Using Linear Programming in Real-Life Problems

For this exercise, students should have some knowledge of *linear* and *quadratic* equations.

Answers to Instructions

1. $C = 1.7x + 1.2y$

2. (b) $x + y \geq 6$; (c) $y \leq 5$

3. (b) $y \geq 6 - x$; (c) $y \leq 5$

6. See illustration at right.

7. The vertex coordinates are (1,5), (2, 4), and (2.5, 5).

8.

x coordinates: c1	*y* coordinates: c2	objective function: c3
1	5	7.7
2	4	8.2
2.5	5	10.25

9. Minimum cost = $7.70.

   The teacher should bake one dozen oatmeal-raisin cookies and five dozen chocolate chip cookies.

Answers to Questions

1. maximum feasible number oatmeal-raisin = 2.5 doz.
   minimum feasible number chocolate chip = 4 doz.

2. No, because the constraints $x + y \geq 6$ and $y \leq 5$ cannot both be true when $x = 0$

3. Generally, the feasible region can have as many sides as there are constraints; for five constraints, the feasible region could be a pentagon.

4. Yes, if the feasible region is not bounded.

Teacher Information *(Continued)*

Activity 4
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(Continued)

Answers to Extra Practice

1. Vertices for part a: (-3, 8), (1.25, 3.75), (2.67, 8).

    minimum = 2; maximum = 13.34

    Vertices for part b: (0, 3), (0, 15), (3, 3) (5.4, 4.2).

    minimum = -45; maximum = 14.4

2. Make 90 long-sleeve and 165 short-sleeve shirts to maximize profits at $855.

3. Make 44 high tops and 95 running shoes to maximize profits at $2,027.