NAME _____ DATE _____ PERIOD _____

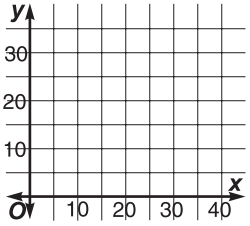
2-7

Practice

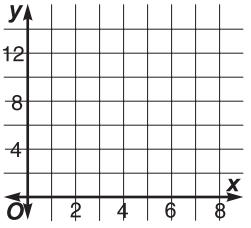
Linear Programming

Graph each system of inequalities. In a problem asking you to find the maximum value of $f(x, y)$, state whether the situation is infeasible, has alternate optimal solutions, or is unbounded. In each system, assume that $x \geq 0$ and $y \geq 0$ unless stated otherwise.

1. $-2y \geq 2x - 36$
$x + y \geq 30$
$f(x, y) = 3x + 3y$

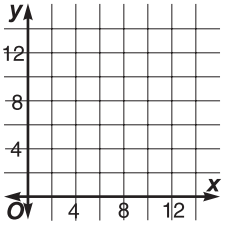
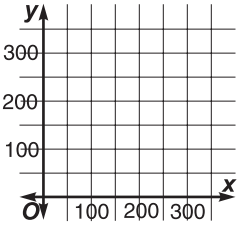


2. $2x + 2y \geq 10$
$2x + y \geq 8$
$f(x, y) = x + y$



Solve each problem, if possible. If not possible, state whether the problem is infeasible, has alternate optimal solutions, or is unbounded.

3. ***Nutrition*** A diet is to include at least 140 milligrams of Vitamin A and at least 145 milligrams of Vitamin B. These requirements can be obtained from two types of food. Type X contains 10 milligrams of Vitamin A and 20 milligrams of Vitamin B per pound. Type Y contains 30 milligrams of Vitamin A and 15 milligrams of Vitamin B per pound. If type X food costs \$12 per pound and type Y food costs \$8 per pound how many pounds of each type of food should be purchased to satisfy the requirements at the minimum cost?



4. ***Manufacturing*** The Cruiser Bicycle Company makes two styles of bicycles: the Traveler, which sells for \$200, and the Tourester, which sells for \$600. Each bicycle has the same frame and tires, but the assembly and painting time required for the Traveler is only 1 hour, while it is 3 hours for the Tourister. There are 300 frames and 360 hours of labor available for production. How many bicycles of each model should be produced to maximize revenue?