Key

Advanced Algebra 2 Homework Tuesday Day week 5

Directions: Read each problem carefully. Write the constraints and the objective function for each problem. **Do NOT graph, find the corner points, or substitute in objective function. Only write constraints and objective function.**

1. A well-known donut store makes two popular types of donuts: crème filled and jelly-filled. The manager knows from past statistics that the number of dozens of donuts sold is at least 10, but no more than 30. To prepare the donuts for frying, the baker needs (on the average) 3 minutes for a dozen crème-filled and 2 minutes for jelly-filled. The baker has at most two hours (how many minutes is this????) available per day to prepare the donuts. How many dozens of each type should be prepared to maximize the daily profit if there is a \$1.20 profit for each dozen crème-filled and \$1.80 profit for each dozen jelly-filled donuts? **(4 or 5 constraints depending on how you write them.)**

   Let x=# dozen of crème-filled ,let y= # dozen jelly-filled

1) $x + y \geq 10$ 2) $x + y \leq 30$ 3) $3x + 2y \leq 120$ 4) $x \geq 0$ 5) $y \geq 0$

$10 \leq x + y \leq 30$

Objective Function: $P = 1.20x + 1.80y$

2. A manufacturer a skis produces two models: a regular ski and a slalom ski. A set of regular skis produces a \$25.00 profit and a set of slalom skis produces a profit of \$50.00. The manufacturer expects a customer demand of at least 200 pairs of regular skis and at least 80 pair of slalom skis. The maximum number of pairs of skis that can be produced by this company is 400. How many of each model of skis should be produced to maximize profits? **(3 constraints)**

   Let x=# of sets of regular skis, let y= # slalom skis

1) $x + y \leq 400$ 2) $x \geq 200$ 3) $y \geq 80$

$\boxed{\text{Why not: } x \geq 0 \quad y \geq 0}$

Objective Function: $P = 25x + 50y$

3. After the hurricanes in Florida in the summer of 2004, FEMA sent disaster relief trucks to the state. Each truck could carry no more than 6000 pounds of cargo. Each case of bottled water weighs 25 pounds and each generator weighs 150 pounds. If each generator helps one household and five cases of water help one household, determine the maximum number of Florida households aided by each truck and how many generators and cases of water should be sent in each truck. Due to the number of trucks and the supply of water and generators nationwide, each truck must contain at least 10 times as many cases of water as generators. **(4 constraints)**

   Let x= #cases of water **,let y=** # generators

1) $25x + 150y \leq 6000$ 2) $x \geq 0$ 3) $y \geq 0$ 4) $x \geq 10y$

So, generators X 10=water

Objective Function: $H = x/5 + 1y$

This one is tricky!!
Think: If you only had 2 cases of water (x) you would NOT have enough for a family---each family needs 5.