

M118 SECTION 5.3 – LINEAR PROGRAMMING

- 1) A linear programming problem is one that is concerned with finding the optimal value (max or min) of a linear objective function.

Theorem 1 – If the optimal value exists, then it must occur at one or more of the corner points of the feasible region.

- Theorem 2**– A) If the feasible region is bounded – both a minimum and a maximum exists.
B) If the feasible region is unbounded – then the minimum exists but the maximum does not.
C) If the feasible region is empty – neither a max nor a minimum exists.

Ex: Find the maximum and minimum of $z = 4x + 2y$
subject to $2x + y \leq 20$
 $10x + y \geq 36$
 $2x + 5y \geq 36$
 $x, y \geq 0$

Ex: Find the maximum and minimum of $z = 20x + 5y$
subject to $6x + 2y \geq 36$
 $2x + 4y \geq 32$
 $y \leq 20$

Ex: South Shore Sails manufactures regular and competition sails. Each regular sail takes 2 hours to cut and 4 hours to sew. Each competition sail takes 3 hours to cut and 10 hours to sew. There are 150 hours available in the cutting department and 380 hours available in the sewing department. If the company makes a profit of \$100 on a regular sail and \$200 on a competition sail, how many sails of each type should the company manufacture to maximize their profit and what is the profit?