Algebra 2/Trig H
3.4 Linear Programming

NOTES

Date____________________

Linear programming is the process of minimizing and/or maximizing a linear objective function subject to a system of linear inequalities called **constraints**.

When graphed, the constraints determine a **feasible region**. A maximum or minimum value of an objective function will occur at a vertex point of the feasible region.

Example 1: **Find the minimum and maximum values of the objective function subject to the given constraints.**

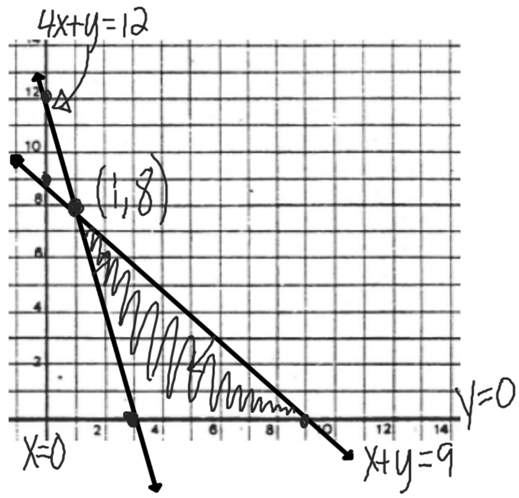
Objective function: $C = 6x - 2y$

Constraints:

$x + y \le 9$
$4x + y \ge 12$
$x \ge 0$
$y \ge 0$

$x+y=9$ $(9,0)$ $(0,0)$

vertices	$C=6x-2y$
$(3,0)$	$C=18$
$(9,0)$	$C=54$ max
$(1,8)$	$C=-10$ min



Example 2: **You are taking a test in which correctly answered type A questions are worth 10 points each and type B questions are worth 15 points each. It takes 3 minutes for each type A question and 6 minutes for each type B question. Total time allowed for the test is 60 minutes. You may not answer more than 16 questions. What is the maximum test score you can earn? How many of each type question must you answer correctly to earn that score?**

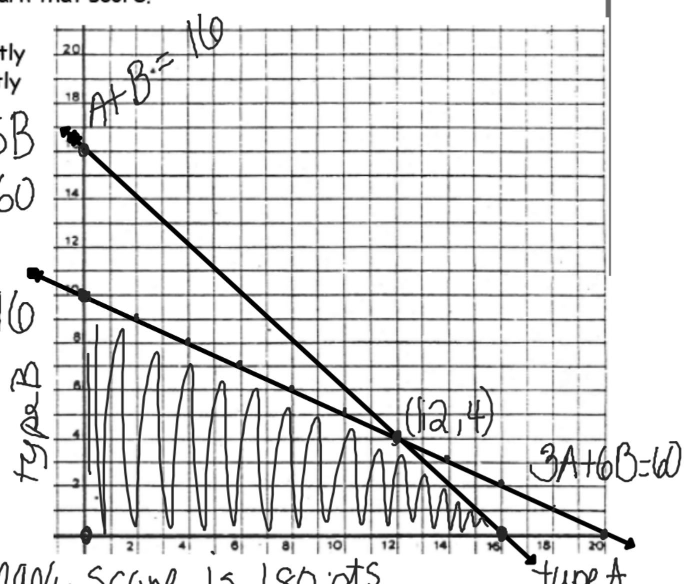
A = number of type A questions you answer correctly
B = number of type B questions you answer correctly

Objective function: (score) $S = 10A + 15B$

Constraints: (total time) $3A + 6B \le 60$

(number of questions) $A + B \le 16$

vertices	$S=10A+15B$
(A,B) $(0,0)$	$S=0$
$(16,0)$	$S=160$
$(0,10)$	$S=150$
$(12,4)$	$S=180$



Max. score is 180 pts
Answer 12 A ques + 4 B ques.