Applications of Math 11
Linear Programming Unit Outline
Chapter 4

General Prescribed Learning Outcomes:

- Represent and analyze situations that involve expressions, equations and inequalities.
- Use linear programming to solve optimization problems.

Specific Prescribed Learning Outcomes:

- **Graph linear inequalities, in two variables.**

Notes:

- Students were introduced to inequalities with one variable in Grade 9 mathematics, where they solved inequalities and graphed inequalities on a number line.
- Coordinate geometry skills are essential for this specific outcome. The concepts of plotting points and intercepts, line graphing, and the use of calculators are the more important concepts to review.
- $Ax + By + C = 0$ can be sketched using intercepts.
- Conversion from the $Ax + By + C = 0$ form to any $y =$ form is a necessary preliminary step to the use of a graphing calculator.
- Window settings, on the graphing calculator, are useful to replace the plotting of horizontal and vertical lines. For example, $x < 5$ could be entered into window settings as an x-max of 5.
- Students should first graph manually—to solve for and sketch the solution region—and then graph using the graphing calculator. An even balance between both approaches is recommended

Acceptable Standard:

- graph the boundary line between two half planes
- use a test point, usually (0, 0), to determine the solution region that satisfies the inequality, given a boundary line
- graph a linear inequality expressed in the form $y = mx + b$, using $<$, $>$, £, ³
- rewrite any inequality expressed in the $Ax + By = C$ form in the $y = mx + b$ form, where A, B, C are integral and $B > 0$

Standard of Excellence:

- distinguish between the use of solid and broken lines in solution regions
- graph any linear inequality in two variables
- rewrite any inequality expressed in the $Ax + By = C$ form in the $y = mx + b$ form, and graph
- explain why the shaded half plane represents the solution region of the inequality