

Exploring inequalities

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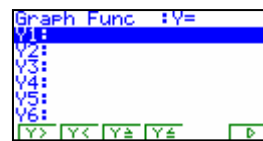
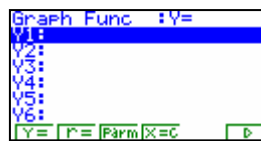
Select GRAPH icon (press 5) from the main menu or by using the arrow keys to highlight and then press EXE.



Symbols: $<$, \leq , $>$, \geq can be used in drawing inequalities.

You can graph one inequality at a time or see them being drawn simultaneously. A useful tool to find 'extreme points' in (or on) a feasible region (boundary), to maximise (or minimise) the objective function.

Setting up the inequalities:



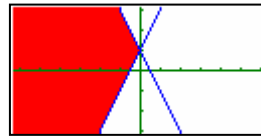
F3

F6

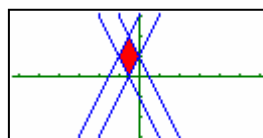
A reminder about the V-Window to view the graphs



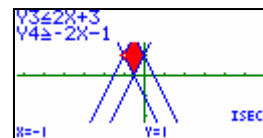
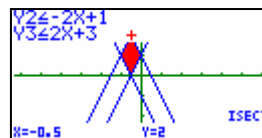
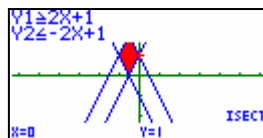
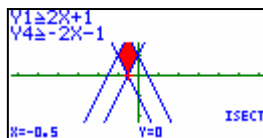
Example 1: Graph $y \geq 2x + 1$ and $y \leq -2x + 1$



Example 2: Graph $y \geq 2x + 1$, $y \geq 2x + 3$, $y \leq -2x - 1$ and $y \leq -2x + 1$ and find the co-ordinates of the vertices



Now, use G-Solv Shift F5 and systematically find the intersection points of Y1 and Y2, Y1 and Y4, Y2 and Y3, Y2 and Y4.



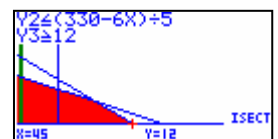
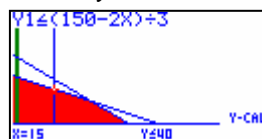
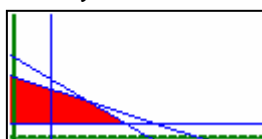
Example 3: Maximise the function $F = 1.5x + 1.3y$ over the region defined by A linear programming problem for this situation has the following constraints:

A: $2x + 3y \leq 150$

B: $6x + 5y \leq 330$

C: $x \geq 15$

D: $y \geq 12$



Vertices are at: (15, 12) (15, 40) (30, 30) and (45, 12)

$F = 1.5 \times 15 + 1.3 \times 12 = 38.1$

$F = 1.5 \times 30 + 1.3 \times 30 = 84$

$F = 1.5 \times 15 + 1.3 \times 40 = 74.5$

$F = 1.5 \times 45 + 1.3 \times 12 = 83.1$

Maximising the function $F = 1.5x + 1.3y$ occurs at the point (30, 30)

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