NCEA Level 2 Mathematics (Homework)
7. Linear Inequalities

Reading

Go and watch...

https://www.youtube.com/watch?v=ij-EK-MZv2Q

What's it good for?

People use systems of inequalities for...

- Economics: the setting of prices and production outputs in companies can often be modelled by a set of inequalities and an equation to maximise or minimise within the feasible region (this is called *linear programming*).
- Engineering: engineering problems like fluid flow through a network can also be modelled with linear programming.

Questions

1. Find the simplest set of inequalities that describes the same feasible region as the following system.

$$\begin{cases} 3x \leq 2 \\ x \leq -y \\ 3x \geq -1 - 3y \\ 8x \geq -2 \\ y \leq 5 \\ x \geq y + 2. \end{cases}$$

2. Consider the following system, the feasible region of which is a square.

$$\begin{cases} x \leq 1 \\ x \geq -1 \\ y \leq 1 \\ y \geq -1 \end{cases}$$

   At what point(s) within the feasible region is $x + 2y$ largest?