



## Year 11 Unit 2

### Inequalities (Foundation plus)

Prior knowledge: Year 10 unit 3 graphs  
Year 10 unit 6 solving linear equations

Leads onto: Year 11 exams  
Year 12 absolute value (modulus) functions

#### What do I need to be able to do?

- Use and understand inequality symbols
- Represent inequalities on a number line
- Solve linear inequalities
  - One sided
  - Two sided
- Draw and identify linear graphs
- Represent linear inequalities on a graph
- Determine a region that satisfies two or more inequalities
- Solve quadratic inequalities

#### Keywords/formula

##### Inequality symbols:

- > greater than
- < less than
- $\geq$  greater than or equal to
- $\leq$  less than or equal to
- $\neq$  not equal to

NOTE all of these are dependent on which way round you say them

**Inclusive inequality:** one which includes the end value eg  $x \geq 4$  includes 4

**Strict inequality:** one which does not include the end value eg  $x > 4$  does not include 4

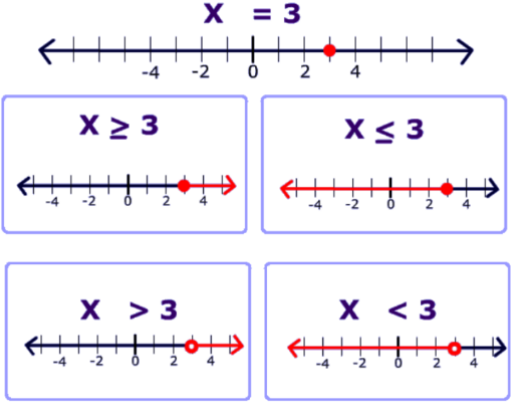
**Integer:** a positive or negative whole number

**Range of values:** all of the possible values that are satisfied by an inequality

**Linear:** an equation or expression that includes no higher powers of  $x$ .

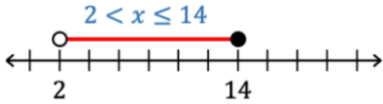
# Linear inequalities

Inequalities can be **represented** on a number line



**Strict inequalities** are represented by an open circle  
**Inclusive inequalities** are represented by a closed circle

Inequalities can represent a value that lies between two points



Inequalities can be **solved** in the same way as equations

$$4x + 1 < 13$$

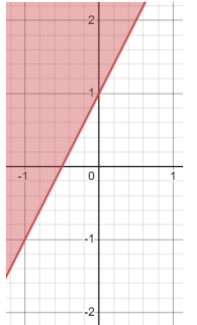
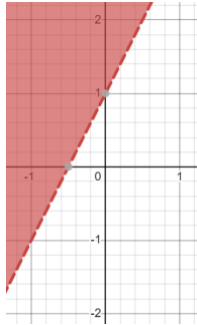
$$4x < 12$$

$$x < 3$$

**Solutions** can be represented as a **range of values** eg  $x < 3$   
 On a **number line** (as above)  
 Or as **integer values** eg 2, 1, 0, -1, -2, -3....

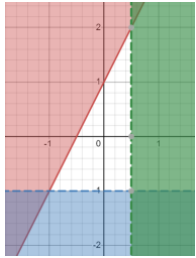
# Graphing inequalities

**Reminder:**  $y = mx + c$  is the general equation of a straight line



**Strict inequalities** are represented by a dashed line:  $y > 2x + 1$   
**Inclusive inequalities** are represented by a solid line:  $y ≥ 2x + 1$

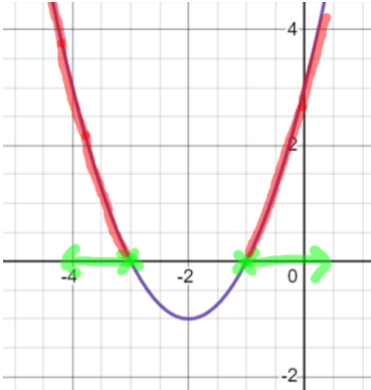
**Regions** can be bounded by two or more inequalities



$$y ≥ 2x + 1$$

$$y < 1$$

$$x > 0.5$$



**Quadratic inequalities** require you to factorise then use the critical values as the key values of the inequalities:  $x^2 + 4x + 3 > 0$   
 has the solutions  $x > -1$  and  $x < -3$