INEQUALITIES

Keywords:	Inequality, region, solve, equation, variable, linear, quadratic
Definition / Description:	An inequality is a statement showing two quantities that are not equal. They can be represented on a number line and on a graph.

Knowledge points:

Inequality notation
Know correct conventions of open circle for strict inequality and closed circle for inclusive inequality

Represent Inequalities on a number line
Show inequalities on a number line using correct notation

Solving linear inequalities
Solve inequalities in one and represent solution set on a number line and using set notation.

Graphical Inequalities
Represent inequalities on a coordinate grid

Solve Quadratic inequalities
Solve quadratics and represent answers on a number line and on a graph

Knowledge point examples:

$x > 1$

x is greater than 1

$x < 5$

x is less than 5

$x \geqslant 2$

x is greater or equal to 2

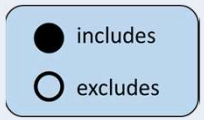
$x \leqslant 0$

x is less than or equal to 0

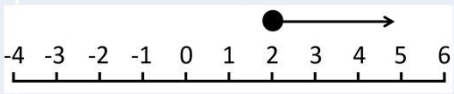
$-3 \leqslant x < 5$

x is greater or equal to negative 3, and smaller than 5

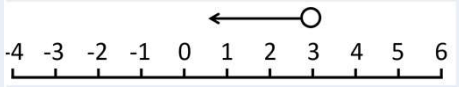
When we represent (plot) **inequalities**, we **must** show whether they **include** or **exclude** the starting number.



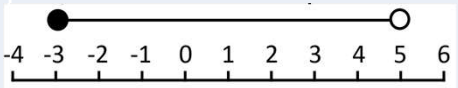
$x \geqslant 2$



$x < 3$



$-3 \leqslant x < 5$



$5y + 10 \leqslant 40$

$-10 \quad -10$

$5y \leqslant 30$

$\div 5 \quad \div 5$

$y \leqslant 6$

$3 < 2x - 7 \leqslant 9$

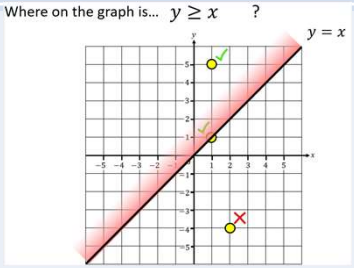
$+7 \quad +7$

$10 < 2x \leqslant 16$

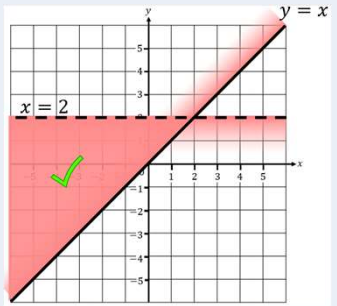
$\div 2 \quad \div 2$

$5 < x \leqslant 8$

$\{6, 7, 8\}$



Shade the region on the graph that satisfies the two inequalities: $y \geq x$ and $x < 2$



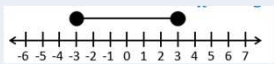
$x^2 \leqslant 9$

Form & solve an **equation** to find the two **bounds**.

$x^2 = 9$

$x = 3$ or $x = -3$

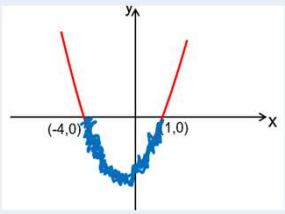
$-3 \leqslant x \leqslant 3$



Solve the inequality

$x^2 + 3x - 4 < 0$

1. Factorise
2. Set y = 0
3. Sketch function
4. It is < 0 so we shade in under the x axis.



$-4 < x < 1$

Linked Knowledge Maps	Solving linear equations Solving quadratic equations Linear graphs Non linear graphs including quadratic