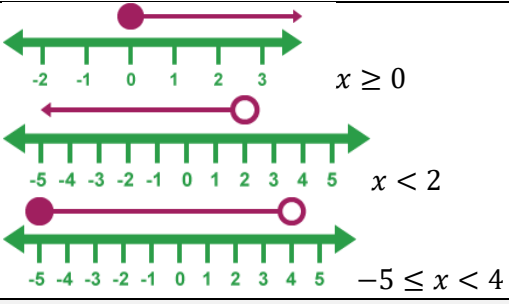
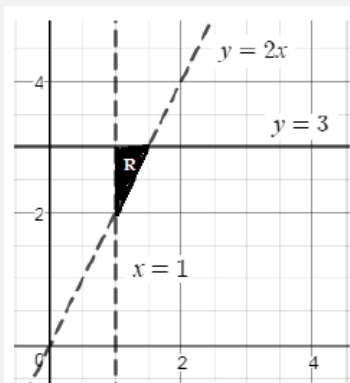



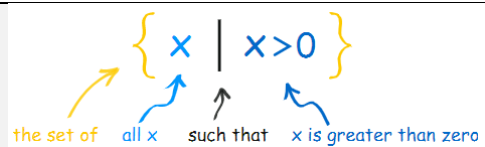
Year 9 Higher Knowledge Organisers
A6 Inequalities Higher only content in blue

Topic/Skill	Definition/Tips	Example
1. Inequality	An inequality says that two values are not equal . $a \neq b$ means that a is not equal to b.	$7 \neq 3$ $x \neq 0$
2. Inequality symbols	$x > 2$ means x is greater than 2 $x < 3$ means x is less than 3 $x \geq 1$ means x is greater than or equal to 1 $x \leq 6$ means x is less than or equal to 6	State the integers that satisfy $-2 < x \leq 4$. -1, 0, 1, 2, 3, 4
3. Inequalities on a Number Line	Inequalities can be shown on a number line. Open circles are used for numbers that are less than or greater than (< or >) Closed circles are used for numbers that are less than or equal or greater than or equal (\leq or \geq)	
4. Graphical Inequalities	Inequalities can be represented on a coordinate grid. If the inequality is strict ($x > 2$) then use a dotted line . If the inequality is not strict ($x \leq 6$) then use a solid line . Shade the region which satisfies all the inequalities.	Shade the region that satisfies: $y > 2x, x > 1$ and $y \leq 3$ 
5. Quadratic Inequalities	Sketch the quadratic graph of the inequality. If the expression is $>$ or \geq then the answer will be above the x-axis . If the expression is $<$ or \leq then the answer will be below the x-axis . Look carefully at the inequality symbol in the question. Look carefully if the quadratic is a positive or negative parabola .	Solve the inequality $x^2 - x - 12 < 0$ Sketch the quadratic:  The required region is below the x-axis, so the final answer is: $-3 < x < 4$ If the question had been > 0 , the answer would have been: $x < -3$ or $x > 4$
6. Set Notation	A set is a collection of things , usually numbers, denoted with brackets { }	{3, 6, 9} is a set.

$\{x \mid x \geq 7\}$ means 'the set of all x's, such that x is greater than or equal to 7'

The 'x' can be replaced by any letter.

Some people use ':' instead of '|'



$$\{x : -2 \leq x < 5\}$$