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| **Topic/Skill**  | **Definition/Tips** | **Example****Topic: Inequalities**  |
| 1. Inequality  | An inequality says that two values are **not equal**.$a\ne b$ means that a is not equal to b. | $$7\ne 3$$$$x\ne 0$$ |
| 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** $(\leq or\geq )$  | $x\geq 0$$x<2$$-5\leq x<4$ |
| 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 $\{ \}$$\left\{x \right| x\geq 7\}$ means ‘the set of all x’s, such that x is greater than or equal to 7’The ‘x’ can be replaced by any letter.Some people use ‘:’ instead of ‘|’ | $\{3, 6, 9\}$ is a set.$$\{x : -2\leq x<5\}$$ |

**Knowledge Organiser**