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| **Topic/Skill** | **Definition/Tips** | **Example**  **Topic: Coordinates and Linear Graphs** |
| 1. Coordinates | Written in **pairs**. The **first** term is the **x-coordinate** (movement **across**). The **second** term is the **y-coordinate** (movement **up or down**) | A: (4,7)  B: (-6,-3) |
| 2. Midpoint of a Line | Method 1: **add the x coordinates and divide by 2**, **add the y coordinates and divide by 2**  Method 2: Sketch the line and find the values half way between the two x and two y values. | Find the midpoint between (2,1) and (6,9)  and  So, the midpoint is (4,5) |
| 3. Linear Graph | **Straight line** graph.  The general equation of a linear graph is  where  **is the gradient** and  **is the y-intercept**.  The **equation** of a linear graph can contain an **x-term**, a **y-term** and a **number**. | Example:  Image result for linear graphOther examples: |
| 4. Plotting Linear Graphs | Method 1: **Table of Values**  Construct a table of values to calculate coordinates.  Method 2: **Gradient-Intercept Method** (use when the equation is in the form )  1. Plots the y-intercept  2. Using the gradient, plot a second point.  3. Draw a line through the two points plotted.  Method 3: **Cover-Up Method** (use when the equation is in the form )  1. Cover the term and solve the resulting equation. Plot this on the  2. Cover the term and solve the resulting equation. Plot this on the  3. Draw a line through the two points plotted. | Image result for gradient intercept method  Image result for cover up method straight line graphs |
| 5. Gradient | The gradient of a line is how **steep** it is.  **Gradient =**  The gradient can be positive (sloping upwards) or negative (sloping downwards) |  |
| 6. Finding the Equation of a Line given a point and a gradient | **Substitute** in the **gradient (m)** and **point (x,y)** in to the equation and **solve for c**. | Find the equation of the line with gradient 4 passing through (2,7). |
| 7. Finding the Equation of a Line given two points | Use the two points to **calculate the gradient**. Then **repeat the method above** using the gradient and either of the points. | Find the equation of the line passing through (6,11) and (2,3) |
| 8. Parallel Lines | If two lines are **parallel**, they will have the **same gradient**. The value of m will be the same for both lines. | Are the lines and parallel?  Answer:  Rearrange the second equation in to the form  Since the two gradients are equal (3), the lines are parallel. |
| 9. Perpendicular Lines | If two lines are **perpendicular**, the **product** of their **gradients** will always equal **-1**.  The gradient of one line will be the **negative reciprocal** of the gradient of the other line.  You may need to rearrange equations of lines to compare gradients (they need to be in the form | Find the equation of the line perpendicular to which passes through (6,5)  Answer:  As they are perpendicular, the gradient of the new line will be as this is the negative reciprocal of 3.  Or |

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| **Topic/Skill** | **Definition/Tips**  **Topic: Non-linear Graphs** | **Example** |
| 1. Coordinates | Written in **pairs**. The **first** term is the **x-coordinate** (movement **across**). The **second** term is the **y-coordinate** (movement **up or down**) | A: (4,7)  B: (-6,-3) |
| 2. Linear Graph | **Straight line** graph.  The **equation** of a linear graph can contain an **x-term**, a **y-term** and a **number**. | Example:  Image result for linear graphOther examples: |
| 3. Quadratic Graph | A ‘**U-shaped**’ curve called a **parabola**.  The equation is of the form  , where , and are numbers, .  If **,** the parabola is **upside down**. | Image result for quadratic graph definition math |
| 4. Cubic Graph | The equation is of the form , where  **is an number**.  If , the curve is **increasing**.  If , the curve is **decreasing**. | Image result for cubic function definition mathImage result for cubic function definition math |
| 5. Reciprocal Graph | The equation is of the form , where  **is a number** and .  The graph has **asymptotes** on the **x-axis and y-axis**. | Image result for reciprocal graph |
| 6. Asymptote | A **straight line** that a graph **approaches** but **never touches**.  **Subject: Maths** | Image result for asymptote definition maths |
| 7. Exponential Graph | The equation is of the form **,** where is a number called the **base**.  If the graph **increases**.  If , the graph **decreases**.  The graph has an **asymptote** which is the **x-axis**. | Image result for exponential function definition math |

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| **Topic/Skill** | **Definition/Tips**  **Topic: Equation of a Circle and Tangent** | **Example** |
| 1. Equation of a Circle | The equation of a **circle**, **centre (0,0),** **radius r**, is: |  |
| 2. Tangent | A straight **line** that **touches** a circle at **exactly one point**, never entering the circle’s interior.  A **radius** is **perpendicular** to a **tangent** at the **point of contact**. | Image result |
| 3. Gradient | **Gradient** is another word for **slope**. | Image result for gradient maths example |
| 4. Circle Theorem 5 | **A tangent is perpendicular to the radius at the point of contact.** | (Pythagoras’ Theorem) |

**Knowledge Organiser**