MATHS – YEAR 10 – UNIT 20

1. Tier 3 Vocabulary

Solve	To find the answer/value of something.
Linear graph	A straight line graph, the general form being $y = mx + c$
Gradient	The gradients of a line is how steep it is.
Parallel lines	If two lines are parallel then they remain the same distance apart. If two lines are parallel then they will have the same gradient.
Perpendicular lines	If two lines are perpendicular then they intersect at right angles. If two lines are perpendicular then the product of their gradients is -1.
Expand	To expand a bracket, multiply each term in the bracket by the expression outside the bracket.
Factorise	Factorising is writing an expression as a product of terms by 'taking out' common factors. It is the reverse of expanding.
Substitution	To replace algebraic terms by numbers. Be careful of expressions such as $5x^2$ as you need to square first, then multiply by 5.
Quadratic	A quadratic expression is one where the greatest power is squared, for example: x^2 $8x^2 - 3x + 7$

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

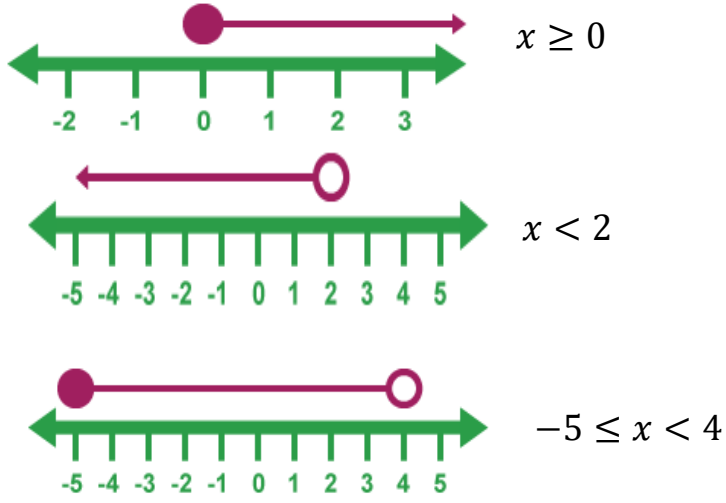
3. INEQUALITIES ON A NUMBERLINE

Inequalities can be shown on a numberline.

Open circles are used for numbers that are les than or greater than (< or >)

Closed circles are used for numbers that are lesson or equal to or greater than or equal to (≤ or ≥)

4. INEQUALITIES ON A NUMBERLINE



5. LINEAR GRAPH

Straight line graph.

The general equation of a linear graph is

$y = mx + c$

where m is the gradient and c is the y-intercept

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6. Tier 3 Vocabulary

Quadratic graph	A '**U-shaped**' curve called a **parabola**. The equation is of the form $y = \boldsymbol{ax^2 + bx + c}$, where a, b and c are numbers, $\boldsymbol{a \neq 0}$. If $\boldsymbol{a < 0}$**,** the parabola is **upside down**.
Cubic graph	The equation is of the form $\boldsymbol{y = ax^3 + k}$, where $\boldsymbol{k}$ **is an number**. If $\boldsymbol{a > 0}$, the curve is **increasing**. If $\boldsymbol{a < 0}$, the curve is **decreasing**.
Reciprocal graph	The equation is of the form $\boldsymbol{y = \frac{A}{x}}$, where $\boldsymbol{A}$ **is a number** and $\boldsymbol{x \neq 0}$. The graph has **asymptotes** on the **x-axis and y-axis**.
Asymptote	A **straight line** that a graph **approaches** but **never touches**.
Exponential graph	The equation is of the form $\boldsymbol{y = a^x}$**,** where a is a number called the **base**. If $\boldsymbol{a > 1}$ the graph **increases**. If $\boldsymbol{0 < a < 1}$, the graph **decreases**. The graph has an **asymptote** which is the **x-axis**.

7. PARALLEL LINES

If two lines are parallel, they will have the same gradient. The value of m will be the same for both lines.

PERPENDICULAR LINES

If two are perpendicular, the product of their gradients will always equal -1. The gradients of one line will be the negative reciprocal of the gradient of the other line.

8. GRADIENT

The gradient of a line is how steep it is

Gradient = $\frac{change\ in\ y}{change\ in\ x}$

The gradient can be positive (sloping upwards) or negative (sloping downwards)

9. FACTORISING QUADRATICS

When a quadratic expression is in the form $x^2 + bx + c$ find the two numbers that add to give b and multiply to give c.

DIFFERENCE OF TWO SQUARES

An expression of the form $a^2 - b^2$ can be factorised to give $(a + b)(a - b)$

10. FACTORISING QUADRATICS

$x^2 + 7x + 10 = (x + 5)(x + 2)$ because 5 and 2 add to give 7 and multiply to give 10

$x^2 + 2x - 8 = (x + 4)(x - 2)$ because +4 and -2 add to give +2 and multiply to give -8

DIFFERENCE OF TWO SQUARES

$x^2 - 25 = (x + 5)(x - 5)$
$16x^2 - 81 = (4x + 9)(4x - 9)$