**Math Reviewer**

**Quadratic Equation**

**Quadratic Equation:**

* **Quadratic Equation** - A **quadratic equation** is a type of **polynomial equation of degree 2**, which means the **highest exponent of the variable (usually x) is 2**.

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| **Formula:** | **Definition:** |

**Table of Values: First Step**

* To graph a quadratic, you can choose several values of **x**, substitute them into the equation, and compute **y**.
* Each pair (**x, y**) forms a point on the graph.
* It’s useful to choose values of **x** around the **vertex (h, k)** because the parabola is symmetric about the vertical line .

**Complete Solution for Corresponding Y-values: Second Step**

* Substitute it into the quadratic expression y=ax2+bx+cy = ax^2 + bx + cy=ax2+bx+c.
* Perform squaring, multiplication, and addition step by step.
* The final result is the **y-value** corresponding to that **x**.

**Graph of a Quadratic Function:**

* When the points from the table of values are plotted, they form a **parabola**.
* **Shape**:
* If a > 0, the parabola opens upward (U-shaped).
* If a < 0, it opens downward (∩-shaped).
* **Width**:
* Larger ∣a∣|a|∣a∣ makes the parabola narrower.
* Smaller ∣a∣|a|∣a∣ makes it wider.
* **Symmetry**: Always symmetric about the line (the axis of symmetry).

**Transforming to Vertex Form:**

* The **standard form** of a quadratic is:
* The **vertex (h, k)** form is:
* **How to Find H:** (This gives the axis symmetry).
* **How to Find k**: Once you have **h**, plug it to the formula of whereas

**Computing X and Y Intercept:**

* **Y-Intercept** – Use the formula whereas and only getting the number from . Meaning the end product looks like
* **X-Intercept** – Use the formula and plug in the values.

**Observations of Value of a, h, and k:**

* **Observation of A Values**:
* If a > 0, the parabola opens **upward** (U-shaped).
* If a < 0, the parabola opens **downward** (∩-shaped).
* **Observation of H Values:**
* If h > 0, parabola shifts **right**.
* If h < 0, parabola shifts **left**.
* **Observations of K Values:**
* If k > 0, parabola is translated **upward**.
* If k < 0, parabola is translated **downward**.

**Example of Quadratic Equation**

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