Honors Math II
Outline for Unit 1 Test 2 – Quadratics

Formulas

Standard Form: $y = ax^2 + bx + c$

Vertex Form: $y = a(x-h)^2 + k$ Vertex (h, k)

Quadratic Formula: $x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Discriminant: $b^2 - 4ac$

- If + perfect, 2 real rational solutions
- If + non-perfect, 2 real irrational solutions
- If 0, 1 real rational solution
- If -, 2 imaginary solutions

Translations: Parent function $y = x^2$ to $y = a(x-h)^2 + k$ How do "a", "h", and "k" transform the parent function?

Other things to know:

- ❖ How to translate from Vertex Form to Standard Form
- ❖ How to translate from Standard Form to Vertex Form
- ❖ How to find the following given Standard Form:
  - **Vertex:** x-coordinate = $\dfrac{-b}{2a}$ . . . substitute to find value of y
  - **X-intercepts**: Let y = 0, solve for x.
    - Factoring
    - Square Roots
    - Quadratic Formula
    - Completing the Square
  - **Y-intercepts**: Let x = 0, solve for y
  - **AOS**: x = $\dfrac{-b}{2a}$ or x = h or x = x-coordinate of vertex
  - **Max or Min**: The vertex always occurs either as a max point or a min point. The max or min is the y-value of the vertex

- ❖ All methods for factoring

- ❖ How to solve quadratic equations
  - Factoring
  - Square Roots
  - Quadratic Formula
  - Completing the Square

- ❖ X-intercepts can also be called roots, zeros, and solutions
- ❖ How to complete the square: $c = \left(\frac{b}{2}\right)^2$
- ❖ How to get vertex form by completing the square

- ❖ How to simplify $(a+b)^2$
  - Examples: 1) $(x-9)^2$

    2) $(7x+2)^2$

- ❖ How to simplify radicals

- ❖ How to simplify with imaginary numbers: $i^2 = -1$, $i = \sqrt{-1}$
  - Examples; 1) $\sqrt{140x^6}$

    2) $-\sqrt{-240}$

    3) $\sqrt{-12} \cdot \sqrt{-15}$

- ❖ Domain (x) and Range (y)

- ❖ How to solve a system of quadratic equations or a system of quadratic and linear equations

- ❖ How to solve and how to graph quadratic inequalities

- ❖ How to graph a system of quadratic inequalities and identify solutions

- ❖ **STUDY all concepts from ISNB!!!**