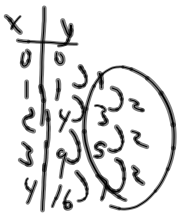
Midterm Review

Quadratics

→ Patterns ... → Levels of Difference



→ Quadratic Functions

3 Forms: Standard, Transformational, general

$y=a(x-h)^2+k$, $\frac{1}{a}(y-k)=(x-h)^2$

Mapping Notation ← Vertex (h,k)

$y=ax^2+bx+c$

$(x,y) \to (x+h, ay+k)$

Properties:

→ y-Intercept, direction, axis of symmetry, domain, Range, Vertex, Max./Min.?? (y-Value at vertex) $x=h$

Sketch

→ Applications of Max./Min. (Equation Provided) (complete the square)

→ Quadratic Equations

→ Solving: Formula

$x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$

- Factor
- Complete the square

$0=(x+2)^2-9$

- Complex Roots: $(i^2=-1)$

..., $x \in C$

$\sqrt{-9}$

$\sqrt{9i^2}$

$\pm 3i$

⇒ Applications

⇒ Nature of Roots: Discriminant

$\Delta = b^2-4ac$

$\Delta<0$
→ Non-Real
→ 2

$\Delta=0$
→ Real
→ 1 solution

$\Delta>0$
→ Real
→ 2

Rate of Change

$m = \frac{y_2 - y_1}{x_2 - x_1}$

ARC => slope between 2 points (secant)

IRC => slope of a tangent at 1 point

Exponentials

⇒ Laws of exponents
  ⇒ Negative, Zero, Fraction

⇒ Exponential Equations *
  ⇒ ① Write as common Bases
  ② Substitution
  (Worksheet 3.5 #10-12)

⇒ Exponential Functions

→ Identify: - common Ratio - Growth or Decay
  - y-Intercept
  - horizontal asymptote

ex. $y = 3(5)^x - 6$

→ Growth

→ common Ratio = 5

(Let x = 0)

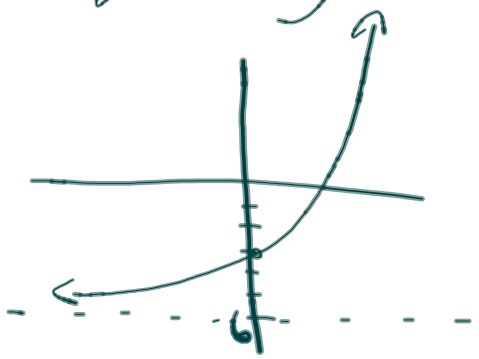
→ y-Int. $y = 3(5)^0 - 6 = 3(1) - 6$

$y = -3$

$3 - 6$

$= -3$

→ Horizontal Asym: $y = -6$



Midterm Preparation

- ⇒ Practice old tests & Quizzes
- ⇒ Practice Sheet
- ⇒ Practice Midterm