

Study Guide Test #2 M120 Sp 15 (Ch. 9 & 5.3)

Skills & Details of Quadratics

- Meaning of Discriminant
 - ✓ Indicates number and type of solutions to a quadratic
 - ✓ Practical application in graphing a parabola to indicate number of x-intercepts
- Methods of Solving Quadratics (remember this finds x-intercepts)
 - ✓ Zero Product (Factor) Property
 - ✓ Quadratic Formula
 - ✓ Square Root Property
 - ✓ Completing the Square

Graphing Parabolas

- Finding vertex
 - ✓ vertex form
 - ✓ $(-\frac{b}{2a}, f(-\frac{b}{2a}))$
 - ✓ using symmetry
- Finding y-intercept
 - ✓ constant in std form $-ax^2 + bx + c$
 - ✓ let $x = 0$ and find value in vertex form
- Finding x-intercept
 - ✓ Let $y = 0$ and solve for x
 - ✓ standard form factor or use quadratic formula
 - ✓ vertex form use square root property
- Finding symmetric points
 - ✓ symmetry from vertex's x-value (axis of symmetry)

Using Parabola's Equation to Find

- Maximum/Minimum Value of a Function
 - ✓ Vertex y-value is maximum if negative "a" & minimum if positive "a"
 - ✓ The x-value is the independent value that yields the max/min (many times it is a time)
- Time for a projectile to hit the ground
 - ✓ The x-intercept (remember that many times one solution is extraneous)
- Time for a projectile to reach any given height
 - ✓ Set function equal to height and solve as you would x-intercept

Modeling Parabolas & Differentiating from Linear Models

- Vertex is known (or can be determined to be known due to symmetry)
 - ✓ Use vertex form & substitute in one other point to solve for "a"
- Vertex is unknown
 - ✓ Use 3 ordered pairs to create a third order system to solve for a, b & c in standard form
- Real World Data
 - ✓ Use symmetry to determine a vertex
 - ✓ From a scatterplot, determine a value that seems to lie on your sketch of a parabola that comes close or hits as many points as possible
 - ✓ Use vertex and point to create equation using vertex form
 - ✓ Alternately: Use Quadratic Regression
- Linear Models Have Constant Rate of Change & Quadratic Models won't

Solving Systems of Equations

- 2nd Order by Elimination from Ch. 5
- 3rd Order by Elimination from Ch. 9