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| **Grade Level** 9TH | | **Teacher/Room**: Lisa Payne/181 Week of: 11/2-11/6  Algebra I 4th period | | | |
| **Unit Vocabulary: SEE ATTACHED LIST** | | | | | |
| **Instructional Strategies Used:** direct instruction, independent study, interactive instruction, partners task, algebra lab, ticket out the door, algebra tech lab, thumbs up/down | | | | | |
| **Day 1** | **Day 2** | | **Day 3** | **Day 4** | **Day 5** |
| **Common Core Standard(s)**:  L9-10RST7  MGSE9-12.REI.4b  MGSE9-12.F.IF.7  MGSE9-12F.BF.3  **SMP- 1,2,4** | **Common Core Standard(s)**:  L9-10RST7  MGSE9-12.REI.4b  MGSE9-12.F.IF.7,8  **SMP- 1,2,4** | | **Common Core Standard(s)**:  L9-10RST7  MGSE9-12.REI.4b  **SMP- 1,2,4** | **Common Core Standard(s)**:  L9-10RST7  MGSE9-12.REI.4b  MGSE9-12.F.IF.6  **SMP- 1,2,4** | **Common Core Standard(s)**:  L9-10RST7  MGSE9-12.REI.4b  MGSE9-12.F.IF.6,7,8  **SMP- 1,2,4** |
| **EQ Question:**  How do I use technology to graph quadratic functions and their transformations? | **EQ Question:**  How do I complete the square? | | **EQ Question:**  How do I use the quadratic formula to find the discriminant and to solve quadratic functions? | **EQ Question:**  How can I analyze functions/use quadratic regression to write equations? | **EQ Question:**  Can I graph, solve, write models of quadratic equations? |
| **Mini Lesson:**  Usatestprep- lab  **Activating Strategies: SQR3**  **Lesson:**  Graphing calculator  Quadratic inequalities  Transformations  **Resource/Materials:**  Books, calculator, review WS, task | **Mini Lesson:**  Checking homework  **Activating Strategies:SQR3**  Factoring polynomials  **Lesson:**  Systems of equations  Completing the square  **Resource/Materials:**  Books, calculator, review WS, task | | **Mini Lesson:**  Checking homework  **Activating Strategies:SQR3**  Factoring polynomials  **Lesson:**  Quadratic formula  **Resource/Materials:**  Books, calculator, review WS, task | **Mini Lesson:**  Checking homework  **Activating Strategies:SQR3**  Factoring polynomials  **Lesson:**  Is the function linear, exponential, or quadratic?  **Resource/Materials:**  Books, calculator, review WS, task | **Mini Lesson:**  Checking homework  **Activating Strategies:SQR3**  Factoring polynomials  **Lesson: Review**  **Chapter 9 review**  **Resource/Materials:**  Books, calculator, review WS, task |
| **Differentiation:**  *content – usatestprep TOD -*  *Grouping Strategy (if any): Grouping*  *teacher selected* | **Differentiation:**  *content – usatestprep TOD -*  *Grouping Strategy (if any): Grouping*  *teacher selected* | | **Differentiation:**  *content - level of difficulty content -*  *Grouping Strategy (if any): Grouping*  *teacher selected* | **Differentiation:**  *content – Centers-*  *Grouping Strategy (if any): Grouping*  *teacher selected* | **Differentiation:**  *content - level of difficulty content -*  *Grouping Strategy (if any): Grouping*  *teacher selected* |
| **Assessment :**  Formative: Warm up, Survey, or homework  Summative: | **Assessment:**  Formative: Warm up, Survey, or homework  Summative: Chapter 8 Vocabulary Quiz | | **Assessment:**  Formative: Warm up, Survey, or homework  Summative: Factoring test | **Assessment:**  Formative: Warm up, Survey, or homework  Summative: | **Assessment:**  Formative: Warm up, Survey, or homework  Summative: |
| **Homework:**  Pg. 561, 1-3  Pg. 563, 4-11  Pg. 569, 8-28 all, 29 | **Homework:**  Pg. 573, 1-9  Pg. 577, 19-35 odd | | **Homework:**  Pg. 587, 17-27 odd, 28, 29-39 odd | **Homework:**  Pg. 593, 20-25 all, 27, 29  Pg. 597, 1-5 all | **Homework:**  Pg. 611, 1-26 all |

Resources and Reflective Notes: Tuesday Factoring review Thursday graphing quadratic centers. Grouping based on the usatestprep assignments.

**STANDARDS ADDRESSED IN THIS UNIT**

**Interpret structure of expressions**

**MGSE9**‐**12.A.SSE.2 Use the structure of an expression to rewrite it in different equivalent forms. For example, see *x*4 – *y*4 as (*x*2)2 – (*y*2)2, thus recognizing it as a difference of squares that can be factored as (*x*2 – *y*2) (*x*2 + *y*2).**

**Write expressions in equivalent forms to solve problems**

**MGSE9–12.A.SSE.3** Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.

**MGSE9–12.A.SSE.3a Factor any quadratic expression to reveal the zeros of the function defined by the expression.**

**MGSE9–12.A.SSE.3b Complete the square in a quadratic expression to reveal the maximum and minimum value of the function defined by the expression.**

**Create equations that describe numbers or relationships**

**MGSE9–12.A.CED.1 Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear, quadratic, simple rational, and exponential functions (integer inputs only).**

**MGSE9-12.A.CED.2 Create linear, quadratic, and exponential equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. (The phrase “in two or more variables” refers to formulas like the compound interest formula, in which A = P(1 + r/n)nt has multiple variables.)**

**MGSE9–12.A.CED.4 Rearrange formulas to highlight a quantity of interest using the same reasoning as in solving equations. *Examples: Rearrange Ohm’s law V = IR to highlight resistance R; Rearrange area of a circle formula A = π r2 to highlight the radius r.***

**Solve equations and inequalities in one variable**

**MGSE9**‐**12.A.REI.4** Solve quadratic equations in one variable.

**MGSE9–12.A.REI.4a Use the method of completing the square to transform any quadratic equation in x into an equation of the form (*x* – *p*)2 = *q* that has the same solutions. Derive the quadratic formula from *ax*2 + *bx* + *c* = 0.**

**MGSE9–12.A.REI.4b Solve quadratic equations by inspection (e.g., for *x*2 = 49), taking square roots, factoring, completing the square, and the quadratic formula, as appropriate to the initial form of the equation (limit to real number solutions).**

**Build a function that models a relationship between two quantities.**

**MGSE9–12.F.BF.1** Write a function that describes a relationship between two quantities.

**Build new functions from existing functions.**

**MGSE9–12.F.BF.3** Identify the effect on the graph of replacing *f*(*x*) by *f*(*x*) + *k*, *k f*(*x*), *f*(*kx*), and

*f*(*x* + *k*) for specific values of *k*(both positive and negative); find the value of *k* given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.

**Understand the concept of a function and use function notation.**

**MGSE9–12.F.IF.1 Understand that a function from one set (the input, called the domain) to another set (the output, called the range) assigns to each element of the domain exactly one element of the range, i.e. each input value maps to exactly one output value. If *f* is a function, *x* is the input (an element of the domain), and *f*(*x*) is the output (an element of the range). Graphically, the graph is *y* = *f*(*x*).**

**MGSE9–12.F.IF.2** Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.

**Interpret functions that arise in applications in terms of the context.**

**MGSE9–12.F.IF.4 Using tables, graphs, and verbal descriptions, interpret the key characteristics of a function which models the relationship between two quantities. Sketch a graph showing key features including: intercepts; interval where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.**

**MGSE9–12.F.IF.5** Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. *For example, if the function h(n) gives the number of person–hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.*

**MGSE9–12.F.IF.6** Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.

**Analyze functions using different representations.**

**MGSE9–12.F.IF.7 Graph functions expressed algebraically and show key features of the graph both by hand and by using technology.**

**MGSE9–12.F.IF.7a Graph linear and quadratic functions and show intercepts, maxima, and minima (as determined by the function or by context).**

**MGSE9–12.F.IF.8** Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.

**MGSE9–12.F.IF.8a Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context. *For example, compare and contrast quadratic functions in standard, vertex, and intercept forms.***

**MGSE9–12.F.IF.9 Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *For example, given a graph of one function and an algebraic expression for another, say which has the larger maximum.***

**STANDARDS FOR MATHEMATICAL PRACTICE**

Refer to the Comprehensive Course Overview for more detailed information about the Standards for Mathematical Practice.

**1.** Make sense of problems and persevere in solving them.

**2.** Reason abstractly and quantitatively.

**3.** Construct viable arguments and critique the reasoning of others.

**4.** Model with mathematics.

**5.** Use appropriate tools strategically.

**6.** Attend to precision.

**7.** Look for and make use of structure.

**8.** Look for and express regularity in repeated reasoning.

**ESSENTIAL QUESTIONS –UNIT 3 (QUADRATICS)**

1. How is a relation determined to be quadratic?

2. How do I choose the most efficient method of solving quadratic equations?

3. How do the factors of a quadratic functions yield the zeros for that function?

4. Where is the maximum or minimum value of a quadratic equation located?

5. How is the quadratic formula developed by completing the square?

6. How can the quadratic formula be used to find the zeros of a quadratic function?

7. What information can be gleaned from the table of values and the graph of a relation?

8. Under what circumstances can one take the square root of both sides of the equation?

9. What does the domain of a function tell about the quantitative relationship of the given data?

10. How is the rate of change for a quadratic function different from the rate of change for a linear function?

11. How can the graph of *f(x)* = *x*2 move left, right, up, down, stretch, or compress?

12. What are the relative advantages and disadvantages of solving a quadratic function by factoring, completing the square, quadratic formula, or taking the square root of both sides?

13. How do I justify the quadratic formula?

14. How do I interpret quadratic functions in context?

Chapter 8 Vocabulary Chapter 9 Vocabulary

Polynomial quadratic function

Binomial parabola

Trinomial axis of symmetry

Degree of a monomial vertex

Degree of a polynomial minimum

Standard form of a polynomial maximum

Leading coefficient double root

FOIL method transformation

Quadratic expression completing the square

Factoring quadratic formula

Factoring by grouping discriminant

Zero product property

Quadratic equation

Prime polynomial

Difference of two squares

Perfect square trinomial

Square root property