

Algebra II Chapter Five Notes

Section 5.1 ~ Graphing Quadratic Functions

Quadratic Function

Graph:

FORMS

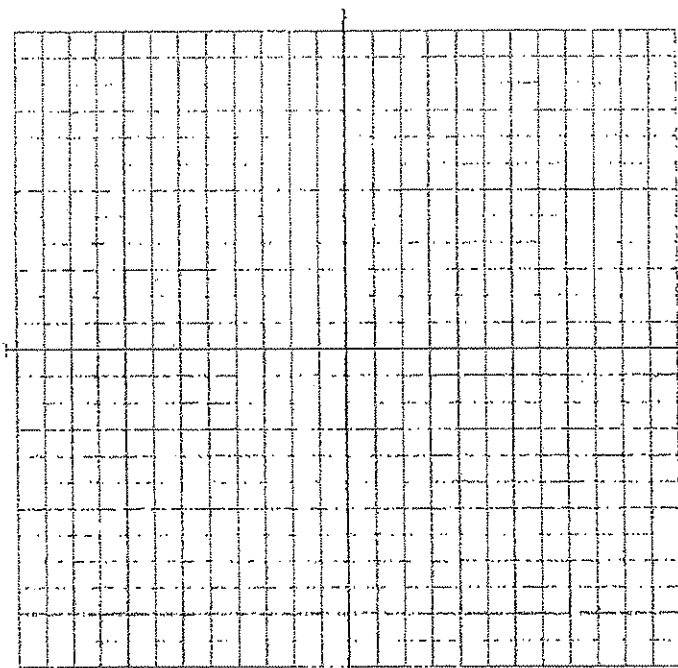
CHARACTERISTICS

Standard Form:

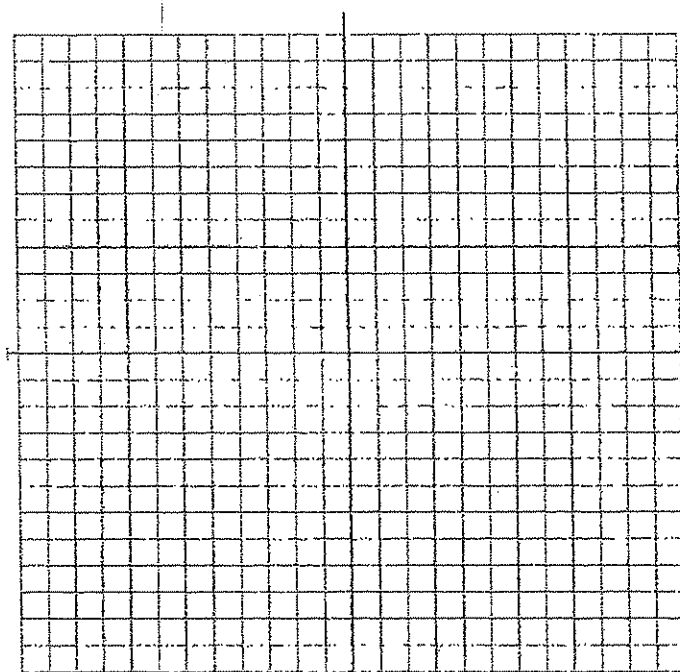
Vertex Form:

Intercept Form:

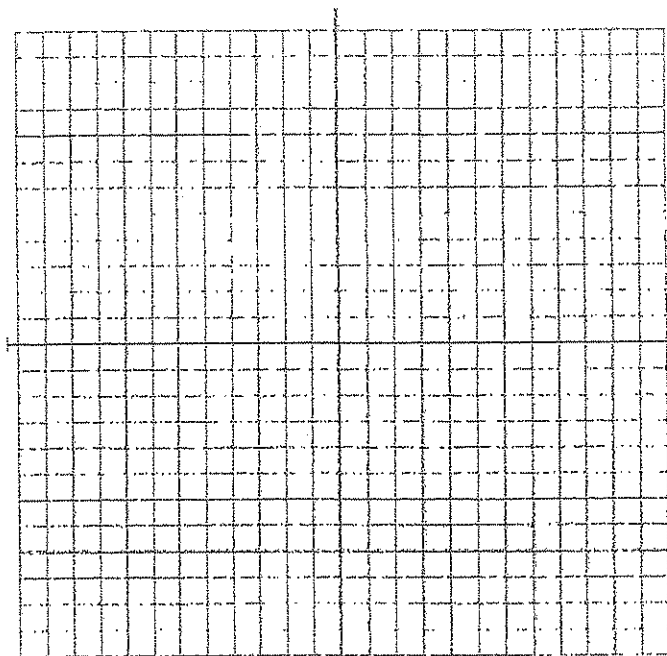
Example One – Graphing a Quadratic Function



Example Two – Graphing a Quadratic Function



Example Three – Graphing a Quadratic Function



****You can convert from vertex and intercept form to standard form by using:**

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L

Example Four – Writing Quadratic Functions in Standard Form

Maximum or Minimum Values

Example Five – Using a Quadratic Model

Suppose that a group of high school students conducted an experiment to determine the number of hours of study that leads to the highest score on a comprehensive year-end exam. The exam score y for each student who studied for x hours can be modeled by:

$$y = -0.853x^2 + 17.48x + 6.923$$

- a) Which amount of studying produced the highest score on the exam?

- b) What is the highest score the model predicts?

Section 5.2 ~ Solving Quadratic Equations by Factoring

Factoring is the process of starting with a _____ and rewriting it as the product of _____. We use this process for many different things.

Factoring $x^2 + bx + c$

1.

2.

3.

Example One – Factoring a Trinomial in Form $x^2 + bx + c$

Factoring $ax^2 + bx + c$

1.

2.

3.

4.

5.

Example Two – Factoring a Trinomial of the Form $ax^2 + bx + c$

Special Factoring Pattern

Example Three – Factoring with Special Patterns

Example Four – Pulling out GCF First

Example Five – Pulling out a GCF First

If you can factor a quadratic equation, you can solve using the:

ZERO PRODUCT PROPERTY

When you solve the quadratic equation you find the _____ also called the function's _____.

Example Five – Solving Quadratic Equations

Example Six – Solving Quadratic Equations

Example Seven – Using a Quadratic Equation as a Model

A painter is making a rectangular canvas for her next painting. She wants the length of the canvas to be 4 feet more than twice the width of the canvas. The area of the canvas must be 30 ft^2 . What should the dimensions of the canvas be?

Section 5.3 ~ Solving Quadratic Equations by Finding Square Roots

In this section we are going to work on simplifying square roots and then solving quadratic functions.

Definitions:

Square root –

Radical –

Properties of Square Roots

Example One – Simplifying Square Roots

Rationalizing the Denominator:

Example Two – Solving a Quadratic Equation

Example Three – Solving a Quadratic Equation

Section 5.4 ~ Complex Numbers

This section introduces a whole new set of numbers. Up until now, we have never been able to solve an equation of this type:

So, to solve this type of problem, a new number was invented called the:

Imaginary Number

Properties of Imaginary Numbers

1.

2.

Example One – Solving a Quadratic Equation

Complex Numbers

1. Sum of Complex Numbers:

2. Difference of Complex Numbers:

3. Multiplying Complex Numbers:

4. Dividing Complex Numbers:

CONJUGATE:

Example Two – Adding and Subtracting Complex Numbers

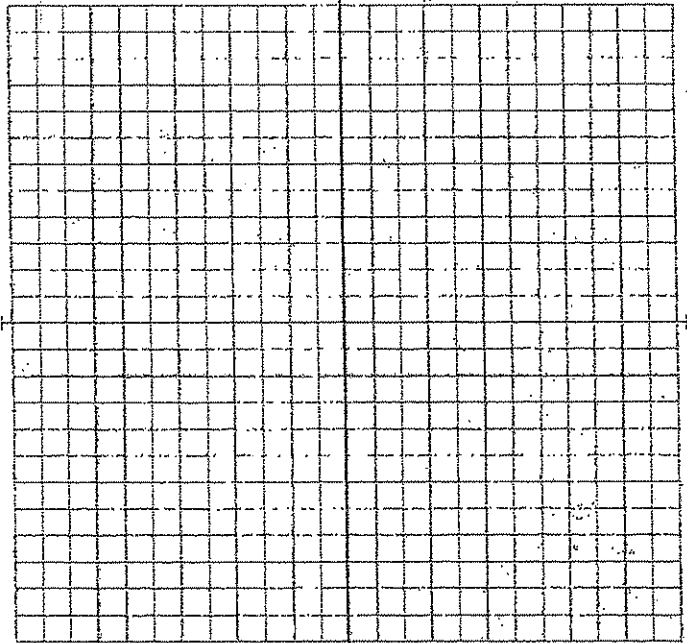
Example Three – Multiplying Complex Numbers

Example Four – Dividing Complex Numbers

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Example Five – Plotting Complex Numbers

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Algebra II Unit 2 Plan

The following table contains the list of assignments and assessments in the general order of how they will be given in class. Keep this sheet in your binder and check off the assignments as you do them or turn them in. I reserve the right to amend this plan when needed in order to obtain needed evidence of learning.

KEY: TC – Teacher Created; HW – Homework; SA – Summative Assessment; FA – Formative Assessment; GA – Group Assignment

Chapter/Unit: Chapter 5/Unit 2

✓	Name	Type	Assessor	Standards
	Preview Assignment	HW	Self/Peer	
	Problems over 5.1	HW	Self/Peer	Q1, Q2, Q3, Q4, Q5
	Problems over 5.1	HW	Self/Peer	Q1, Q2, Q3, Q4, Q5
	RLA over Graphing Quadratics	FA	Self/Teacher	Q1, Q2, Q3, Q4, Q5
	Quiz over 5.1	FA	Self/Teacher	Q1, Q2, Q3, Q4, Q5
	Problems over 5.2	HW	Self/Peer	Q6, Q7
	Problems over 5.2	HW	Self/Peer	Q6, Q7
	RLA over Solving Quadratics	FA	Self/Teacher	Q6, Q7
	Quiz over 5.2	FA	Self/Teacher	Q6, Q7
	Test over Chapter 5A – A	SA	Teacher	Q1 – Q7
	Problems over 5.3	HW	Self/Peer	Q7, Q8
	RLA over Solving Quadratics #2	FA	Self/Teacher	Q7, Q8
	Problems over 5.4	HW	Self/Peer	C1, C2
	Quiz over 5.3 and 5.4	FA	Self/Teacher	Q7, Q8, C1, C2
	Ongoing Review Project	SA	Teacher	All Standards
	Test over Chapter 5A – B	SA	Teacher	Q7, Q8, C1, C2

Scattered throughout the unit will be short writing assignments and whiteboard work given as short formative assessments. These will be applied when necessary. There are also many practice-type assignments and activities we do to help solidify learning (in class, not homework).

In your folder you need to keep the following: all homework assignments and scored formative assessments plus any extra worksheets or activities we might do in class to help in understanding.

Standards Covered in this Chapter
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Quadratic Functions

- Q1: Students will be able to identify the main parts of the graph of a quadratic function and they will be able to describe what the “most important” points on a quadratic are and why they are important.
- Q2: Students will be able to graph quadratic functions in standard form. They will also be able to write quadratic equations in standard form.
- Q3: Students will be able to graph quadratic functions in vertex form.
- Q4: Students will be able to graph quadratic functions in intercept form.
- Q5: Students will be able to find maximum or minimum values using a quadratic model by hand and by using calculator functions.
- Q6: Students will be able to factor and solve quadratic functions in the form $ax^2 + bx + c$ and by using the difference of squares pattern.
- Q7: Students will be able to set up and solve a real life problem using a quadratic model.
- Q8: Students will be able to solve a quadratic equation when it is in vertex form by finding square roots. Students will simplify the radicals when necessary.

Complex Numbers

- C1: Students will be able to define imaginary numbers and explain why it is necessary to have them in mathematics.
- C2: Students will be able to simplify complex numbers using addition, subtraction, multiplication and division.

