Learning Works Charter School

Integrated Math 2A
Module 4

Student Name: _____ Teacher Name: _____

As you work through the chapters in your Integrated Math 2 course, you will be encouraged to think and to make conjectures while you persevere through challenging problems and exercises. You will make errors – and that's okay! Learning and understanding occur when you make errors and push through mental roadblocks to comprehend and solve new and challenging problems.

Text: *Integrated Math 2*, Big Ideas, 2016

To ensure you are learning, you must show your work for all exercises.
YOU WILL NOT EARN CREDIT FOR ANSWERS WITHOUT WORK.

Chapter 4: Solving Quadratic Equations (4.1-4.9)

_____ Maintaining Mathematical Proficiency (page 189): Complete exercises #1-6 all

_____ 4.1 Properties of Radicals: Read the lesson and complete exercises
#5, 7, 9, 10, 13, 15, 17, 18, 20, 21, 22, 25, 27, 29, 31, 36, 37, 45, 46, 49, 50, 53, 55, 56

_____ 4.2 Solving Quadratic Equations by Graphing: Read the lesson and complete exercises
#5, 6, 7, 8, 13, 14, 18, 22, 25, 43, 45, 60

_____ 4.3 Solving Quadratic Equations by Using Square Roots: Read the lesson and complete exercises
#3, 4, 7, 8, 9, 10, 12, 13, 16, 20, 22, 25, 26, 31, 40

_____ 4.4 Solving Quadratic Equations by Completing the Square: Read the lesson and complete exercises #5, 8, 10, 11, 13, 14, 17, 18, 19, 25, 27, 33, 37, 39, 51

_____ 4.5 Solving Quadratic Equations Using the Quadratic Formula: Read the lesson and complete exercises #1, 3, 4, 5, 6, 9, 11, 13, 15, 23, 25, 26, 31, 53

_____ 4.6 Complex Numbers: Read the lesson and complete exercises
#1, 5, 6, 7, 9, 10, 13, 15, 21, 22, 23, 26, 37, 39, 40, 62

_____ 4.7 Solving Quadratic Equations with Complex Solutions: Read the lesson and complete exercises #1-27 **odd**, 35, 43, 45

Students must complete the Chapter Review and Project with a teacher or tutor at school.

_____ Chapter Review (pages 268-272): Complete exercises #1-43 **all**

_____ Complete the attached Project **(No project = No credit)**

A teacher or tutor reviewed the Chapter Review and Project with the student.

Date: _____ Signature: _____

Grade

Continued on next page

Integrated Math 2 Project
Module 4: Solving Quadratic Equations
Textbook Pages: 189-274

Quadratics in the World

Be sure to answer questions in complete sentences.

For this project, you will be identifying parabolas in the real world. Parabolas are everywhere. As you walk around today, try to see if you can notice parabolas around you, even in the room you are in right now!

1. Search online for "parabolas in the real world" and choose one image of a parabola. Print the picture out so that it is large enough to transfer onto a piece of graph paper. (Note: Your Google search may give you other shapes in addition to parabolas. So even if it looks like a parabola, it might not be! Be careful to notice the difference between a semi-circle and a parabola. A semi-circle is NOT a parabola and will NOT work for this project. For example, stone arches are semi-circles and will not work).

2. Transcribe (trace) the real world parabola onto a piece of graph paper.

3. Add a coordinate plane onto this same piece graph paper (x- and y-axes).

4.
    a) Does the parabola open upward or downward?

    b) How will this feature of the graph be represented in the equation?

5.
    a) What is the maximum/minimum value of the parabola?

    b) How did you determine this value?

    c) What does this value represent in the real world?

6. What is the y-intercept?

7. What are the roots/zeros/x-intercepts of the parabola?

8. What is the actual height of the object? Use Google search to find the real height. If it is a natural object (water fountain, dolphins jumping, etc.), estimate a realistic height including units (inches, feet, yards, miles, etc.).

9. How does the actual height relate to the units on the coordinate plane?

$$\frac{Actual\ height\ (units)}{Height\ on\ graph} =$$

10. Write the quadratic equation in Vertex Form.

11. Write the quadratic equation in Standard Form.

12. Solve the quadratic equation using any method to prove you have correctly identified your x-intercepts.

13. Why do you think the parabola shape is used in the construction of the object? OR Why do you think this object naturally follows a parabolic curve?