

Math 11 Pre-Calculus LG 5

QUADRATIC FUNCTIONS



INTRODUCTION:

Quadratic functions are used in many activities to describe an arcing motion. In Physics, the motion of any projectile moving through the air can be explained using a quadratic equation. By the end of this learning guide you will understand what a quadratic function looks like when it is graphed, and you will be able to describe some characteristics of the graph from the equation.



LEARNING GUIDE EXPECTATIONS:

On the completion of this learning guide you will be able to:

- 1) analyze and graph quadratic functions and identify the vertex, domain and range, x and y intercepts, axis of symmetry, and direction of opening.
- 2) convert quadratic functions from standard form to vertex form by “completing the square”.



EVALUATION:

You are ready to progress to the next learning guide when you can demonstrate your understanding of the above expectations. Please refer to your Mathematics 11 Pre-Calc Marks Record Sheet to determine the assessment.



RESOURCES NEEDED:



Math 11 Pre-Calc Text



Math 11 Pre-Calc Learning Guides.

LEARNING ACTIVITIES:



Expectation #1: Analyze and graph quadratic functions, and identify the vertex, domain and range, x and y intercepts, axis of symmetry, and direction of opening.



1. [Watch and take notes on instructional video on Quadratic Functions.](#)



2. In the Math 11 text, complete the Investigation activity on pages 143-144.



3. [Watch and take notes on instructional video on Graphing and Analyzing Quadratic Functions.](#)

4. In the Math 11 text, read and take notes on the material between pages 144-156. Make sure to include the highlighted/bold words.
5. In the Math 11 text, read and take notes between pages 164-172. Complete the Example 1 **Your Turn** section on pages 166-168.



6. Read Key Ideas on pages 156 & 174. In your math journal, explain the difference between **vertex form** and **standard form** for the equation of a **parabola** including a graph and discussion of what happens to the graph when the values of a, p, and q are changed in different ways. Use appropriate terminology in your explanation.



7. Complete the **Check Your Understanding** questions listed below:
 - pages 157-162 #1 → 10, 12, 14, 16a, and 17
 - pages 174-179 #1, 2, 4 → 10, 12, 15, and 17



Expectation #2: Convert quadratic functions from standard form to vertex form by “completing the square”.



1. [Watch and take notes on instructional video on Completing the Square.](#)



2. In the Math 11 text, read and take notes from pages 180-192 making sure to indicate which example you found the easiest to understand.
3. In the Math 11 text, work through Example 2 on pages 187-188. Now complete the **Your Turn** section on page 188.
4. In the Math 11 text, work through Example 3 on pages 188-189. Now complete the **Your Turn** section on page 189.



5. Read Key Ideas on page 192. In your math journal, using an example of your choice, create a step by step set of instructions on **Completing the Square** that can be used by any student who takes Math 11 in the future. (make it easier to read than the textbook)



6. Complete the **Check Your Understanding** questions listed below:
 - pages 192-197 #1 → 16, 22, and 23

REVIEW AND CHALLENGE



1. In the Math 11 text, complete the Chapter 3 Review pages 198-200.
2. Complete all Journal activities.

Key terms: quadratic function, parabola, vertex, minimum value, maximum value, axis of symmetry, vertex form, standard form, domain, range, x-intercept, y-intercept, completing the square.

PRACTICE QUIZZES

[Practice quiz #1](#)

[Practice quiz #2](#)

[Practice quiz #3](#)

[Practice quiz #4](#)