# Mathematics
# Algebra 1: Academic
# Unit 9: Quadratic Equations and Functions

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| **Essential Understandings** | ▪ Future success in algebra is based on the knowledge of quadratic equations and functions. |
| **Essential Questions** | ▪ How do you evaluate and approximate square roots?<br>▪ How do solve quadratic equations by finding square roots?<br>▪ How do you use the properties of radicals to simplify radicals?<br>▪ How do you sketch the graph of a quadratic function?<br>▪ How do you use a graph to find or check a solution of a quadratic equation?<br>▪ How do you solve quadratic equations using the quadratic formula?<br>▪ How do you use the discriminant to find the number of solutions of a solve quadratic equations? |
| **Essential Knowledge** | ▪ Certain square roots must be memorized.<br>▪ Quadratic equations can be solved by finding square roots.<br>▪ Properties of radicals can be used to simplify radicals.<br>▪ Quadratic equations can be solved by graphing. |
| **Vocabulary** | ▪ <u>Terms</u>:<br>○ square root, radicand, radical expression, quadratic equation, parabola, quadratic formula, discriminant, vertex, axis of symmetry, quadratic roots. |
| **Essential Skills** | ▪ Evaluate and approximate square roots.<br>▪ Solve quadratic equations by finding square roots.<br>▪ Use the properties of radicals to simplify radicals.<br>▪ Graph quadratic functions.<br>▪ Solve quadratic equations by graphing.<br>▪ Solve quadratic equations by quadratic formula.<br>▪ Determine and understand discriminant to find the number of solutions of a quadratic equation. |

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| **Related Maine Learning Results** | Mathematics<br>A. Number<br>Real Number<br>A1.Students will know how to represent and use real numbers.<br>b. Estimate the value(s) of roots and use technology to approximate them.<br>c. Compute using laws of exponents.<br>D. Algebra<br>Symbols and Expressions<br>D1.Students understand and use polynomials and expressions with rational exponents.<br>a. Simplify expressions including those with rational numbers.<br>Equations and Inequalities<br>D2.Students solve families of equations and inequalities.<br>b. Solve quadratic equations graphically, by factoring in cases where factoring is efficient, and by applying the quadratic formula. |
| **Sample Lessons And Activities** | ▪ Students will orally respond to questions.<br>▪ Students will utilize worksheets and in their notes to demonstrate individual understanding of the concepts. |
| **Sample Classroom Assessment Methods** | ▪ Quizzes<br>▪ Take-home worksheets<br>▪ Tests |
| **Sample Resources** | ▪ Publications:<br>o Algebra -Foerster |