

Mathematics
Algebra II: Academic
Unit 4: Polynomial Functions

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| Essential Understandings | <ul style="list-style-type: none"> ▪ Polynomial functions can be used to model real-life situations. |
| Essential Questions | <ul style="list-style-type: none"> ▪ What are the properties of Algebra and how are these used to solve polynomial equations? ▪ How do you manipulate polynomial expressions? ▪ How do you solve polynomial equations? ▪ How do you draw reasonable graphs of polynomial functions? |
| Essential Knowledge | <ul style="list-style-type: none"> ▪ Factoring, the rational root theorem, and synthetic division are used to solve polynomial equations. ▪ Complex numbers are used to solve polynomial equations with non-real roots. ▪ The degree of the polynomial determines the number of solutions. |
| Vocabulary | <ul style="list-style-type: none"> ▪ <u>Terms</u>: <ul style="list-style-type: none"> ○ polynomial function, degree of an equation, zeros or roots of an equation, synthetic division, end behavior, maximum and minimum values, zero product rule, complex numbers |
| Essential Skills | <ul style="list-style-type: none"> ▪ Apply order of operation. ▪ Manipulate polynomial expressions. ▪ Solve polynomial functions by various means. ▪ Sketch reasonable graphs of polynomial functions. |
| Related Maine Learning Results | <p><u>Mathematics</u></p> <p>A. Number Real Number A1.Students will know how to represent and use real numbers.</p> <ol style="list-style-type: none"> a. Use the concept of nth root. b. Estimate the value(s) of roots and use technology to approximate them. c. Compute using laws of exponents. d. Multiply and divide numbers expressed in scientific notation. e. Understand that some quadratic equations do not have real solutions and that there exist other number systems to allow for solutions to these equations. <p>B. Data Measurement and Approximation B1.Students understand the relationship between precision and accuracy.</p> <ol style="list-style-type: none"> a. Express answers to a reasonable degree of precision in the context of a given problem. b. Represent an approximate measurement using appropriate numbers of significant figures. c. Know that most measurements are approximations and explain why it is useful to take the mean of repeated measurements. |

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| Related Maine Learning Results | <p>Data Analysis</p> <p>B2.Students understand correlation and cause and effect.</p> <ol style="list-style-type: none"> a. Recognize when correlation has been confused with cause and effect. b. Create and interpret scatter plots and estimate correlation and lines of best fit. c. Recognize positive and negative correlations based on data from a table or scatter plot. d. Estimate the strength of correlation based upon a scatter plot. <p>B3.Students understand and know how to describe distributions and find and use descriptive statistics for a set of data.</p> <ol style="list-style-type: none"> a. Find and apply range, quartiles, mean absolute deviation, and standard deviation (using technology) of a set of data. b. Interpret, give examples of, and describe key differences among different types of distributions: uniform, normal, and skewed. c. For the sample mean of normal distributions, use the standard deviation for a group of observations to establish 90%, 95%, or 99% confidence intervals. <p>B4.Students understand that the purpose of random sampling is to reduce bias when creating a representative sample for a set of data.</p> <ol style="list-style-type: none"> a. Describe and account for the difference between sample statistics and statistics describing the distribution of the entire population. b. Recognize that sample statistics produce estimates for the distribution of an entire population and recognize that larger sample sizes will produce more reliable estimates. c. Apply methods of creating random samples and recognize possible sources of bias in samples |
| Sample Lessons And Activities | <ul style="list-style-type: none"> ▪ Solve polynomial equations using a variety of techniques. These include graphing, factoring and synthetic division. ▪ Use long division and synthetic division to divide polynomials. ▪ Use binomial expansion (Pascal's triangle) to expand binomial expressions raised to positive integer powers. |
| Sample Classroom Assessment Methods | <ul style="list-style-type: none"> ▪ Evaluate homework. ▪ Quizzes. ▪ Chapter test. |

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| <p>Sample Resources</p> | <ul style="list-style-type: none">▪ <u>Publications:</u><ul style="list-style-type: none">○ Holt Algebra 2○ McDougal Littell Algebra 2▪ <u>Other Resources:</u><ul style="list-style-type: none">○ Graphing calculators○ The A+ learning system for remediation |
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