

**Lower Cape May Regional**

<b>CONTENT AREA: Mathematics</b>	<b>Course: Honors Pre-Calculus</b>	<b>UNIT #: 1</b>	<b>UNIT NAME: Functions and Relations</b>
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#	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
<b>1</b>	Find common and binomial factors of quadratic expressions and factor special quadratic expressions. Solve quadratic equations by factoring	HSA-SSE.B.3a HSN-SSE.A.2 HSA-APR.C.5 HSA-CED.A.1
<b>2</b>	Graph linear equations and write equations of lines.	HSG-GPE.B.5 HAS-CED.A.2 HSF-IF.B.6
<b>3</b>	Solve quadratic equations	HAS-CED.A.2 HSA-SSE.B.3a HSA-SSE.B.3b
<b>4</b>	Write the equation of a circle in standard form by completing the square	HSN.CN.B.6
<b>5</b>	Simplify rational expressions, multiply and divide rational expressions and solve rational expression	HSA-SSE.A.1A HSA-SSE.A.1b HSA-SSE.A.2 HSA-APR.D.6 HSA-APR.D.7

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<b>6</b>	Identify properties of rational functions and graph rational functions.	HSA-APR.B.3 HSF-IF.C.7d HSF-IF.B.4
<b>7</b>	Use partial fraction decomposition to rewrite a complex rational expression into a series of simple rational expressions	HSA-SSEA.2 HSA-SSE.A.1b
<b>8</b>	Simplify expressions with rational exponents	HSN-RN.A.1 HSN-RN.A.2

### Selected Opportunities for Connection to Mathematical Practices

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

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<b>Code #</b>	<b>Common Core State Standards</b>
<b>HSA-SSE.B.3a</b>	Factor a quadratic expression to reveal the zeros of the function it defines.
<b>HSN-SSE.A.2</b>	Use the structure of an expression to identify ways to rewrite it. <i>For example, see <math>x^4 - y^4</math> as <math>(x^2)^2 - (y^2)^2</math>, thus recognizing it as a difference of squares that can be factored as <math>(x^2 - y^2)(x^2 + y^2)</math>.</i>
HSA-APR.C.5	Know and apply the binomial theorem for the expansion of $(x + y)^n$ in powers of $x$ and $y$ for a positive integer $n$ , where $x$ and $y$ are any numbers, with coefficients determined for example by Pascal's Triangle.
HSA-CED.A.1	Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.
HSG-GPE.B.5	Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems.

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HAS-CED.A.2	Interpret expressions that represent a quantity in terms of its context. a. Interpret parts of an expression, such as terms, factors, and coefficients. b. Interpret complicated expressions by viewing one or more of their parts as a single entity. <i>For example, interpret <math>P(1+r)^n</math> as the product of <math>P</math> and a factor not depending on <math>P</math>.</i>
HSF-IF.B.6	Calculate and interpret the average rate of change of a function over a specified interval. Estimate the rate of change from a graph.
HSA-CED.A.2	Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
HSA-SSE.B.3a	Factor a quadratic expression to reveal the zeros of the function it defines.
HSA-SSE.B.3b	Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.
HSN.CN.B.6	Calculate the distance between numbers in the complex plane as the modules of the difference, the midpoint of a segment as the average of the numbers of the endpoints.
HSA-SSE.A.1a	Interpret parts of an expression, such as terms, factors, and coefficients.
HSA-SSE.A.1b	Interpret complicated expressions by viewing one or more of their parts as a single entity.
HSA-SSE.A.2	Use the structure of an expression to identify ways to rewrite it.
HSA-APR.D.6	Rewrite simple rational expressions in different forms.

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HSA-APR.D.7	Understand that rational expressions form a system analogous to the rational numbers, closed under addition, subtraction, multiplication and division by a nonzero rational expression; add, subtract, multiply and divide rational expressions
HSA-APR.B.3	Identify zeros of polynomials when suitable factorization are available, and use the zeros to construct a rough graph of the function.
HSF-IF.C.7d	Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behaviors.
HSF-IF.B.4	For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities , and sketch graphs showing key features given a verbal description of the relationship.
HSN-RN.A.1	Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms or rational exponents.
HSN-RN.A.2	Rewrite expressions involving radicals and rational exponents using properties of exponents.