

**Preparation for College Math III**

**MATH003**

**Fall 2015**

This is a continuation of MATH002 for students who need to complete additional modules. This is a computer-based learning course designed to provide the fundamental concepts of arithmetic and algebra and examine some application of these concepts, i.e. word problems. Students are required to complete a minimum of 5 modules, but are encouraged to complete as many of the 15 modules as possible. Students who begin at module 12 or higher are required to finish through module 15. The modules cover whole numbers, signed numbers, fractions, decimals, ratios and proportions, percentages, descriptive statistics, algebraic expressions, linear equations and inequalities, graphing lines and inequalities, systems of equations, exponents, polynomials, factoring, rational expressions, quadratic equations, and related applications. Credits earned in this course cannot be applied towards graduation. Prerequisite: C- or higher in Preparation for College Math II (MATH002) or Introductory Algebra (MATH011) or waiver by placement testing results or departmental approval.

Modules 11-15

COURSE OUTCOMES	OUTCOMES ACTIVITIES
At the end of this course, students will be able to	
Apply the properties of rational exponents in order to facilitate the use of these properties in further topics and problems in mathematics.	<ol style="list-style-type: none"> <li>1. Simplify exponential expressions using:               <ol style="list-style-type: none"> <li>a. <math>b^n \cdot b^m = b^{n+m}</math></li> <li>b. <math>(b^n)^m = b^{nm}</math></li> <li>c. <math>(ab)^n = a^n b^n</math></li> <li>d. <math>\frac{b^n}{b^m} = b^{n-m}</math> when <math>b \neq 0</math></li> <li>e. <math>\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}</math> when <math>b \neq 0</math></li> <li>f. <math>b^0 = 1</math> when <math>b \neq 0</math></li> <li>g. <math>b^{-n} = \frac{1}{b^n}</math> when <math>b \neq 0</math> (CT,QS)</li> </ol> </li> <li>2. Translate between exponential and radical forms using:               <ol style="list-style-type: none"> <li>a. <math>b^{\frac{1}{n}} = \sqrt[n]{b}</math> when <math>n</math> is a positive integer greater than 1</li> <li>b. <math>b^{\frac{m}{n}} = \sqrt[n]{b^m} = (\sqrt[n]{b})^m</math> when <math>n</math> is a positive integer greater than 1 and <math>m</math> is any integer. (CT,QS)</li> </ol> </li> <li>3. Scientific Notation (CT, QS)</li> </ol>
Perform the operations of addition, subtraction, multiplication, and division on polynomials in order to	<ol style="list-style-type: none"> <li>1. Find sums and differences of polynomial expressions. (W,R,CT,QS)</li> </ol>

<p>apply these skills to factoring, solving equations, and problem solving.</p>	<ol style="list-style-type: none"> <li>2. Multiply polynomial expressions including: monomial by monomial, monomial by polynomial, and polynomial by polynomial. (W,R,CT,QS)</li> <li>3. Find special products including: square of a binomial and binomial times conjugate. (W,R,CT,QS)</li> <li>4. Divide a polynomial by a monomial. (W,R,CT,QS)</li> <li>5. Solve applied problems using operations on polynomials. (W,R,CT,QS)</li> </ol>
<p>Solve various types of factoring problems in order to apply these skills to further topics and problems in mathematics.</p>	<ol style="list-style-type: none"> <li>1. Factor a monomial from a polynomial. (W,R,CT,QS)</li> <li>2. Factor by grouping. (W,R,CT,QS)</li> <li>3. Factor a trinomial of the form <math>x^2 + bx + c</math>. (W,R,CT,QS)</li> <li>4. Factor a trinomial of the form <math>ax^2 + bx + c</math>. (W,R,CT,QS)</li> <li>5. Factor the difference of two perfect squares. (W,R,CT,QS)</li> <li>6. Factor a perfect square trinomial. (W,R,CT,QS)</li> <li>7. OPTIONAL: Factor the sum or difference of two cubes. (W,R,CT,QS)</li> <li>8. Use multiple factoring techniques to factor completely any expression. (W,R,CT,QS)</li> <li>9. Solve equations by factoring. (W,R,CT,QS)</li> <li>10. Solve applied problems using factoring. (W,R,CT,QS)</li> </ol>
<p>Simplify and perform operations on rational expressions in order to apply these skills to further topics and problems in mathematics.</p>	<ol style="list-style-type: none"> <li>1. Simplify rational expressions (reduce to lowest terms). (CT,QS,R)</li> <li>2. Multiply and divide rational expressions. (CT,QS,R)</li> <li>3. Add and subtract rational expressions with like denominators and with unlike denominators. (CT,QS,R)</li> <li>4. Solve rational equations. (CT,QS,R)</li> <li>5. Simplify complex fractions. (CT,QS,R)</li> <li>6. Solve applied problems. (CT,QS,R)</li> </ol>
<p>Demonstrate the ability to simplify and perform operations with radicals in order to apply these skills to further topics and problems in mathematics.</p>	<ol style="list-style-type: none"> <li>1. Simplify radical expressions. (CT,QS,R)</li> <li>2. Add, subtract, and multiply radical expressions. (CT,QS,R) subtraction and multiplication. (W,R,CT,QSS)</li> <li>3. Rationalize denominators (monomial square root denominators and binomial square root denominators). (W,R,CT,QS)</li> <li>4. Solve radical equations. (W,R,CT,QS)</li> <li>5. Solve applied problems. (W,R,CT,QS)</li> </ol>
<p>Solve quadratic equations in order to apply these skills to further topics and problems in mathematics.</p>	<ol style="list-style-type: none"> <li>1. Solve by factoring. (CT,QS)</li> <li>2. Solve by the square root method. (CT,QS)</li> <li>3. Solve by the quadratic formula. (CT,QS)</li> <li>4. OPTIONAL: Solve by completing the square. (CT,QS)</li> <li>5. Solve applied problems. (CT,QS,W,R)</li> </ol>
<p>Strengthen Core Competencies** in order to increase success in this and other courses and in the workplace.</p>	<p>Referenced above</p>

\*\*Indicate the Core Competencies that apply to the outcomes activities and assessment tools: Critical Thinking (CT); Technology Skills (TS); Oral Communications (OC); Quantitative Skills (QS); Reading (R); Writing (W).