

**Precalculus**  
**MATH 217**  
**Fall 2015**



This course continues the mathematics preparation for successful completion of calculus. Topics include the operation and use of graphing utilities, the properties and graphs of rational functions, one-to-one and inverse functions, exponential and logarithmic functions, and trigonometric functions. Prerequisite: C- or higher in MATH 203 College Algebra; waiver by placement testing results; or departmental approval.

COURSE OUTCOMES	OUTCOMES ACTIVITIES
At the end of this course, students will be able to	
Use a graphing utility in order to apply these skills to further topics and problems in mathematics and related courses.	<ol style="list-style-type: none"> <li>1. Use the graphing function of a graphing utility. (CT,TS)</li> <li>2. Use the table function of a graphing utility. (CT,TS)</li> </ol>
Graph rational functions in order to apply these skills to further topics and problems in mathematics and related courses.	<ol style="list-style-type: none"> <li>1. Graph a rational function. (CT,QS,R,TS)               <ol style="list-style-type: none"> <li>a) Find the domain</li> <li>b) Find horizontal, vertical, and/or slant asymptotes</li> <li>c) Identify any symmetry</li> <li>d) Find x &amp; y intercepts</li> </ol> </li> <li>2. Solve rational inequalities. (CT,QS,R,TS)</li> <li>3. Evaluate the difference quotient for rational function. (CT,QS,R)</li> </ol>
Demonstrate knowledge of one-to-one and inverse functions in order to apply these skills to further topics and problems in mathematics and related courses.	<ol style="list-style-type: none"> <li>1. Determine whether a function is one-to-one. (CT,QS,R)</li> <li>2. Find the inverse of a function algebraically and graphically. (CT,QS,R,TS)</li> <li>3. Verify that two functions are inverses of each other algebraically and graphically. (CT,QS,TS)</li> <li>4. Find the domain and range of a function and its inverse. (CT,QS,TS)</li> <li>5. Sketch the graph of a function and its inverse. (CT,TS)</li> </ol>
Demonstrate knowledge of logarithmic and exponential functions in order to apply these skills to further topics and problems in mathematics and related courses.	<ol style="list-style-type: none"> <li>1. Evaluate and graph exponential and logarithmic functions manually and on the calculator. (CT,QS,R,TS)</li> <li>2. Convert between logarithmic and exponential forms. (CT,QS,R)</li> <li>3. Use the change-of-base formula to rewrite and evaluate logarithmic functions with different bases. (CT,QS,R,TS)</li> <li>4. Use properties of logarithms to evaluate, rewrite, expand or condense logarithmic expressions. (CT,QS,R)</li> <li>5. Solve exponential and logarithmic equations. (CT,QS,R,TS)</li> <li>6. Solve applied problems using exponential and</li> </ol>

	logarithmic functions. (CT, QS, R, TS, W)
Demonstrate knowledge of the trigonometric functions in order to apply these skills to further topics and problems in mathematics and related courses.	<ol style="list-style-type: none"> <li>1. Convert between degree and radian measure. (CT, QS, R, TS)</li> <li>2. Evaluate trigonometric functions of any angle. (CT, QS, R, TS)</li> <li>3. Determine the domain, range, and period of a trigonometric function. (CT, QS, R)</li> <li>4. Sketch the graphs of the six trigonometric functions. Such as <math>y = a \sin(bx + c)</math> (CT, QS, R, TS)</li> <li>5. Determine the period, amplitude, phase shift, and graph of a sinusoidal function. (CT, QS, R)</li> <li>6. Solve problems/equations using the trigonometric identities, formulas, and properties, including the fundamental identities, even-odd properties, double-angle formulas, and half-angle formulas. (CT, QS, R)</li> <li>7. Evaluate basic inverse trigonometric functions with and without a calculator. (CT, QS, R, TS)</li> <li>8. Graph basic inverse trigonometric functions. (CT, QS, TS)</li> <li>9. Solve trigonometric equations with and without a calculator. (CT, QS, R, TS)</li> <li>10. Use trigonometric functions to model and solve applications. (CT, QS, R, TS)</li> <li>11. Use the Law of Sines and the Law of Cosines. (CT, QS, R, TS)</li> </ol>
OPTIONAL: Demonstrate knowledge of polar equations in order to apply these skills to further topics and problems in mathematics and related courses	<ol style="list-style-type: none"> <li>1. Plot points using polar coordinates. (CT, QS, TS)</li> <li>2. Convert back and forth between polar and rectangular coordinates. (CT, QS)</li> <li>3. Graph polar equations by hand and by using a graphing utility. (CT, QS, TS)</li> </ol>
To strengthen Core Competencies ** in order to increase success in this and other courses and in the workplace.	Referenced above

\*\*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).