CHAPTER 1: FUNDAMENTALS

The student shall be able to:

1.2 EXPONENTS AND RADICALS

1.2.1 Use the Laws of Integer Exponents to simplify expressions with integer exponents. *Chapter 1 review #17.*

1.2.2 Know the definition of rational exponents, and use the Laws of Exponents to simplify expressions with rational exponents. *Chapter 1 review #13, 14, 18b and 20a.*

1.2.3 Know and apply the rules for simplifying radical expressions. *Section 1.2 #74, 76 and 82.*

1.2.4 Simplify exponents and express the answer with positive exponents only. *Chapter 1 Review #20.*

1.2.5 Know how to rationalize the denominator of a radical expression. *Chapter 1 Review #49 and 51.*

1.3 ALGEBRAIC EXPRESSIONS

1.3.1 Know the special factoring formulas, difference of squares, perfect squares, difference of cubes, sum of cubes, and factoring by grouping. *Section 1.3 #77, 83, 82, 85, and 89.*

1.3.2 Factor a trinomial and algebraic expressions with rational exponents completely. *Chapter 1 Review #25, 26, 28, 29, 33, 36 and 37.*

1.4 RATIONAL EXPRESSIONS

1.4.1 Simplify a rational expression after factoring the numerator and denominator. *Section 1.4 # 19, 21 and 22.*

1.4.2 Multiply and divide rational expressions and express them in reduced form. *Chapter 1 Review #43 and 44.*

1.4.3 Add and subtract rational expressions with same and different denominators. *Chapter 1 Review #45 and 46.*

1.4.4 Simplify compound fractional expressions. *Section 1.4 #73 and 78.*

1.4.5 Simplify rational expressions with rational exponents. *Section 1.4 # 81 and 83.*

1.4.6 Know how to rationalize numerator. *Chapter 1 Review #50.*

1.5 EQUATIONS

1.5.1 Solve a linear equation. *Section 1.5 #22.*

1.5.2 Solve a quadratic equation by factoring, using square root method, using the quadratic formula and by completing the squares. *Chapter 1 Review #59, 62 and 65.*

1.5.3 Solve rational equations and look for extraneous solutions. *Chapter 1 Review #66 and 67.*

1.5.4 Solve absolute value equations. *Chapter 1 Review #69.*

1.5.5 Solve radical equations, and equations reducible to quadratic form. *Section 1.5 #107, 108 and 110.*

1.5.6 Solve literal equations. *Section 1.5 #35 and 38.*

1.8 INEQUALITIES

1.8.1 Solve linear inequalities and express the solution using interval notation and graph the solution set on a real number line. *Chapter 1 Review #87 and 88.*

1.8.2 Solve quadratic inequalities and polynomial inequalities using a sign analysis or the cut point method. *Chapter 1 Review #89 and 90.*

1.8.3 Solve rational inequalities using a sign analysis or the cut point method. *Chapter 1 Review #91 and 92.*

1.8.4 Solve absolute value inequalities. *Chapter 1 Review #93 and 94.*

1.9 THE COORDINATE PLANE, GRAPHS OF EQUATIONS, CIRCLES

1.9.1 Know the distance and midpoint formulas to find the distance and midpoint between given two points. *Section 1.9 #41.*

1.9.2 Know the equation of the circle in standard form. *Chapter 1 Review Concept Check #32.*

1.9.3 Find the center and radius from the given equation of circle in standard form. *Section 1.9 #83 and 87.*

1.9.4 Find the center and radius of the circle not in standard form by completing the square. *Chapter 1 Review #103 and 104.*

1.9.5 Know the types of symmetry and test a given equation for symmetry. *Chapter 1 Review #113, 115 and 117.*

CHAPTER 2: FUNCTIONS

The student shall be able to:

2.1 FUNCTIONS

2.1.1 Know the definition of a function and how to interpret functions in four different ways: using arrow notation, ordered pair notation, using a table, and using a formula. *Chapter 2 Review #1, 3 and 6.*

2.1.2 Determine whether the given equation defines y as a function of x. *Chapter 2 Review #39 and 41.*

2.1.3 Evaluate the given function for the given value and expression. *Chapter 2 Review #9 and 10.*

2.1.4 Evaluate a piecewise defined function. *Section 2.1 #32 and 33.*

2.1.5 Find and simplify the difference quotient of the function. *Section 2.1 #46 and 49.*

2.1.6 Know the definition of domain and range. *Section 2.1 Concepts #2*.

2.1.7 Find the domain and range of the given functions. *Chapter 2 Review #13 and 14.*

2.1.8 Find the domain of the given functions. *Chapter 2 Review #15, 16, 17 and 18*.

2.1.9 Use the given real-life model to evaluate the function and interpret what the values represent. *Section 2.1 #79 and 80.*

2.1.10 Create a piecewise defined function using a real-life application and evaluate it. *Section 2.1 #88.*

2.2 GRAPHS OF FUNCTIONS

2.2.1 Understand the form and key properties for linear, power, root, reciprocal and absolute value functions and sketch the graph of the function by making table of values. *Chapter 2.2 #10 and 17.*

2.2.2 Sketch the graph of the piecewise function. *Chapter 2.2 #37, 38 and 43.*

2.2.3 Know the definition of vertical line test and use it to determine whether the given relation is a function or not. *Chapter 2.2 #51.*

2.2.4 Determine the domain and range from the given graph of the function. *Chapter 2.2 #55 and 56.*

2.2.5 Use the given graph to create a piecewise defined function. *Section 2.2 #49.*

2.2.6 Use a graphing device to graph the family of functions. *Section 2.2 #70, 71 and 74.*

2.2.7 Model a real-life applications as a piecewise function and graph it. *Section 2.2 #82.*

2.3 GETTING INFORMATION FROM THE GRAPH OF A FUNCTION

2.3.1 Use the given graph to evaluate the function and find the domain and range from the given graph of the function. *Section 2.3 #7 and 8.*

2.3.2 Determine the intervals where the function is increasing and decreasing, and find the local extrema of a function based on the graph of the function. *Section 2.3 #43 and 46*

2.3.3 Use a graphing device to determine the Intervals where the function increases and decreases. *Chapter 2 Review #49 and 50.*

2.3.4 Use a graphing device to locate the local maximum and local minimum of a function. *Chapter 2 Review #75 and 77.*

2.5 LINEAR FUNCTIONS AND MODELS

2.5.1 Express linear function in the form $f(x) = ax + b$.
2.5.2 Understand the interpretation of the slope as a rate of change and be able to interpret what the slope means when the axes are labeled. *Section 2.5 # 39, 40.*
2.5.3 Determine whether the given function is linear. *Chapter 2 Review # 57 and 58.*
2.5.4 Express verbal description as a linear function. *Section 2.5 # 28.*
2.5.5 Given a linear function. (a) Sketch the graph of the function. (b) Determine what is the slope of the graph? (c) Determine what is the rate of change of the function? *Chapter 2 Review # 59.*
2.5.6 Determine the slope and rate of change from the real-life linear model. *Section 2.5 # 40.*
2.5.7 Write a linear function that describes a relationship between two quantities, use it to solve and interpret the slope. *Section 2.5 # 43, 49 and 50.*

2.6 TRANSFORMATION OF FUNCTIONS

2.6.1 Understand translations by sketching the graphs of f(x)+c and f(x+c) given the graph of f(x). *Section 2.6 # 7, 8, 19, 20 24a, 24b, 29, 31, 33, 34.*
2.6.2 Understand reflections by sketching the graphs of -f(x) and f(-x) given the graph of f(x). *Section 2.6 # 9a, 10a, 13a, 14a, 22a, 23c, 37, 38, 48*
2.6.3 Understand vertical and horizontal stretching and shrinking of graphs by sketching the graphs of af(x) and f(ax) given the graph of f(x). *Section 2.6 # 9b, 10b, 13b, 14a, 41, 42, 43.*
2.6.4 Suppose the graph of *f* is given. Describe how the graph of each function is obtained from the graph of *f*. *Chapter 2 Review # 71(a),(b), (c), (d) ,(e) and (f).*
2.6.5 Know the basic graphs of $f(x) = ax + b, f(x) = b, f(x) = x^2, f(x) = x^3, f(x) = \sqrt{x}$, $f(x) = x^n, and\ f(x) = |x|$.
2.6.6 Use transformations to sketch the graph of the given function from the known graph of parent functions. *Chapter 2 Review # 27, 30, 34, 36 and 37.*
2.6.7 Given the graph of a function apply transformation to sketch the graph of required function. *Chapter 2 Review # 72.*
2.6.8 Use a graphing device to sketch the graph of family of functions in same viewing rectangle and interpret how graphs are related. *Section 2.6 # 78*
2.6.9 Use the given two graphs and explain how the graph of one function can be obtained from the second one by applying transformations. *Section 2.6 # 93.*
2.6.10 Know the definition of even-odd functions.
2.6.11 Determine whether the given functions are even, odd or neither. *Chapter 2 Review # 73.*

2.7 COMBINING FUNCTIONS

2.7.1 Know how to create new functions from given functions by using the algebra of functions (sums, differences, quotients, and products) and find the domain of the new functions. *Section 2.7 #13 and 14.*

2.7.2 Given two functions *f* and *g*, find *f+g, f-g, f.g, f/g* and their domains. *Section 2.7 #8, 13 and 15.*

2.7.3 Know the definition of the composite function and it's domain.

2.7.4 Evaluate composite functions using the given graph of functions. *Section 2.7 #35 and 36.*

2.7.5 Evaluate composite functions using the given function as formulas. *Chapter 2 Review # 84(c) and 84(d).*

2.7.6 Evaluate composite functions using functions given as tables. *Section 2.7 #39-46.*

2.7.7 Find the composite functions algebraically and their domain. *Chapter 2 Review # 85 and 86.*

2.7.8 Decompose a composite function into its components form. *Chapter 2 Review # 88.*

2.7.9 Model a real-life application using composite function. *Section 2.7 # 78 and 82.*

2.8 ONE-TO-ONE FUNCTIONS AND THEIR INVERSES

2.8.1 Know the definition of a one-to-one function. *Section 2.8 # 17, 18, 19.*

2.8.2 Use the horizontal line test to determine whether the graph of the given function is one-to-one. *Section 2.8 # 7, 8, 10.*

2.8.3 Determine algebraically whether the given function is one-to-one. *Chapter 2 Review # 89 and 90.*

2.8.4 Determine graphically whether the given function is one-to-one. *Section 2.8 # 7 -10.*

2.8.5 Determine whether the given function is one-to-one over its domain. *Chapter 2 Review #89 and 90.*

2.8.6 Given the graph of a one-to-one function, know how to evaluate the inverse of a function at various values. *Section 2.8 # 29, 30.*

2.8.7 Evaluate the inverse function at a specific value. *Section 2.8 # 26 and 27.*

2.8.8 Know how the graph of inverse function is obtained from the given graph of the function. *Section 2.8 # 85, 86, 88.*

2.8.9 Find the formula for the inverse of the given function. *Chapter 2 Review # 95, 96, 97 and 98.*

2.8.10 Use the inverse function property to determine whether the given functions are inverse of each other. *Section 2.8 # 43 and 45*

2.8.11 Show that the given function is one-to-one, sketch the graph of the given function, use the graph to sketch the graph of its inverse, then find the formula for the inverse function. *Chapter 2 Review # 102.*

2.8.12 Know how to restrict the domain of the given function to make it one-to-one and then find its inverse. *Section 2.8 # 87 and 88.*

MODELING WITH FUNCTIONS

1. Identify the quantity you want to model and express it as a function of the other quantities in the problem. Assign a symbol *x*, to one variable, and express the other variables in terms of this symbol. *Page 240 # 3,4, 12, 13 and 14.*

2. Construct the model as a function of single variable and use this function to solve the real-life application. *Page 240 # 21,22, 25, 26 and 27.*
3. Apply the model in one variable to determine algebraically and/or graphically maximum/minimum attributes for two-dimension and three-dimension problems. *Page 240 # 26 and 27.*

CHAPTER 3: POLYNOMIAL AND RATIONAL FUNCTIONS

The student shall be able to:

3.1 QUADRATIC FUNCTIONS AND MODELS

3.1.1 Understand what is meant by the standard form and general form of a quadratic function. *Chapter 3 Review Concept check 1a), 2a).*

3.1.2 Express a quadratic function in standard form by using completing the square or the formula $x = -\frac{b}{2a}$ to graph the function. *Chapter 3 Review #3*

3.1.3 Find the maximum or minimum value of the quadratic function algebraically. *Chapter 3 Review #5 and #6*

3.1.4 Solve extreme value word problems by creating a model of a quadratic function. *Chapter 3 Review #7 and #8*

CHAPTER 4: EXPONENTIAL AND LOGARITHMIC FUNCTIONS

The student shall be able to:

4.1 EXPONENTIAL FUNCTIONS

4.1.1 Create a table of values for the exponential function $y = 2^x$ with x having integral values.

4.1.2 Know the graph of $y = a^x + b \ where \ a > 1$ and its attributes (increasing, 1-1, intercept, asymptote, domain, and range). *Section 4.1 # 27*

4.1.3 Know the graph of $y = a^x + b \ where \ 0 < a < 1$ and its attributes (decreasing, 1-1, intercept, asymptote, domain, and range). *Section 4.1 # 28*

4.1.4 Evaluate exponential functions rounded to three places using a calculator. *Chapter 4 Review # 1-4*

4.1.5 Sketch the graph of an exponential function, state the domain, range, and asymptote. *Section 4.1 #27, 28, 37 and 38.*

4.1.6 Given the sketch of $y = a^x + b$, its asymptote, and a point on the graph, be able to identify *a* and *b. Chapter 4 Review 4.1 #21 and 24*

4.1.7 Given the sketch of $y = a^x + b$, and two points on the graph, be able to identify *a* and *b.*

4.1.8 Given the initial population and the rate of doubling of a population, be create a model use the model to determine how many are present after a certain amount of time. *Section 4.1 #53 and 54.*

4.1.9 Use the compound interest formula to determine the future and present value of an investment given the year. *Section 4.1 # 57, 59, 61 and 62*

4.2 THE NATURAL EXPONENTIAL FUNCTION

4.2.1 Know that *e* is the value of $(1+\frac{1}{n})^n \; as \; n \; gets \; large.$

4.2.2 Know the value of *e* to 2 places.

4.2.3 Be able to graph natural exponential functions, identify its asymptote, domain, and range. *Section 4.2 # 8, 10, and 14.*

4.2.4 Given a model of a population of species, compute the population at certain years. *Chapter 4 Review #103*

4.2.5 Understand the simple interest formula, the compound interest formula, and the continuous compound interest formula. *Section 4.2 # 33-39*

4.2.6 Look at growth models employing *e* and determine the initial population, the population after a certain number of years, and as $t \to \infty$. *Section 4.2 # 25 and 28*

4.3 LOGARITHMIC FUNCTIONS

4.3.1 Understand the definition of log a as the inverse of the exponential function. Understand that the log is an exponent.

4.3.2 Understand the definition of a log expression by finding the $\log_a b$ where b is a whole number power of a. *Chapter 4 Review #29*

4.3.3 Understand the definition of a log expression by finding the $\log_a b$ where b is an integral power of a. *Chapter 4 Review #32*

4.3.4 Understand the definition of a log expression by finding the $\log_a b$ where b is a rational power of a. *Chapter 4 Review #40*

4.3.5 Understand the definition of a log expression by rewriting $\log_a b$ = c in exponential form. *Chapter 4 Review #21 and 24*

4.3.6 Understand the definition of a log expression by rewriting $a^c = b$ in log form. *Chapter 4 Review #26 – 28*

4.3.7 Be able to sketch the graph of a log function and identify its domain, range, and asymptote. *Chapter 4 Review #11 – 14*

4.3.8 Know the basic log properties $\left(\log_a 1 = 0,\ \log_a a = 1,\ \log_a a^x = x,\ and\ \ a^{\log_a x} = x\right)$ *Section 4.3 # 25*

4.3.9 Know what common logs and natural logs are by evaluating numerical ln and log expressions. *Section 4.3 # 45 and 47*

4.3.10 Know the basic log properties where the base is e and 10. *Chapter 4 Review # 31, 32,33 and 38*

4.3.11 Given the sketch of $y = \log_a x + b$, its asymptote, and a point on the graph, be able to

identify a and b. *Section 4.3 # 57 and 58*

4.3.12 Given the sketch of $y = \log_a x + b$, and two points on the graph, be able to identify a and b.

4.3.13 Find the domain and range of a log function. *Chapter 4 Review #17, 18 and 19*

4.3.14 Use the properties of logs to evaluate an expression without a calculator. *Chapter 4 Review # 35, 37 and 40*

4.4 THE LAWS OF LOGS

4.4.1 Know the Laws of Logs: Understand the similarities between the laws of logs and the laws of exponents.

4.4.2 Use the log laws to expand a logarithmic expression. *Chapter 4 Review #48 and 49*

4.4.3 Use the log laws to combine logarithmic expressions into a single log. *Chapter 4 Review #52, 53 and 55*

4.4.4 Given $\log_a 2$ is one numerical value, and $\log_a 7$ is another numerical value, use the log laws to find the exact values of $\log_a 14$, $\log_a \frac{4}{7}$, and $\log_a 98$, and $\log_a 14a^3$.

4.4.5 Understand the change of base formula and how to use it. *Chapter 4 Review #85 and 87*

4.5 EXPONENTIAL AND LOGARITHMIC EQUATIONS

4.5.1 Find the exact solution(s) to exponential equations. *Chapter 4 Review # 58, #61 and #64*

4.5.2 Use a calculator to find the solution(s) to exponential equations rounded to 4 places. *Chapter 4 Review #71 and 73*

4.5.3 Find the exact solution(s) to logarithmic equations. *Chapter 4 Review # 67 – 70*

4.5.4 Use a graphing calculator and sketch the graph of the log and exponential functions and find the local Extrema and asymptotes. *Chapter 4 Review #77 and 78*

4.5.5 Demonstrate understanding of logarithms by clearly explaining which log is larger. *Chapter 4 Review #89*

4.5.6 Find the inverse of the exponential function $f(x) = e^{x+a} - b$, where a and b are integers. *Section 4.5 # 83 and 84*

4.5.7 Find the inverse of the log function $f(x) = \ln(x - a) + b$, where a and b are integers. *Section 4.5 # 85 and 86*

4.5.8 Sketch and label an exponential function, base e, as well as it's asymptote. Identify the x- and y- Intercepts exact, and accurate to 2 places using a graphing calculator.

4.5.9 Sketch and label a natural log function as well as it's asymptote. Identify the x- and y-intercepts exact, and accurate to 2 places using a graphing calculator.

4.5.10 Find the time it takes for a principal to double or triple at different % rates and different compounding methods. *Chapter 4 Review #92 and 93*

4.5.11 How long will it take for a principal to double or triple if compounded monthly, quarterly, and continuously. *Chapter 4 Review #94*

4.6 MODELING WITH EXPONENTIAL FUNCTIONS

4.6.1 Compute population sizes given the year, relative growth rate, and initial population *Chapter 4 Review #97.* Given the date, continuous growth rate and initial population, determine the year it will take for the initial population to grow to a certain size. *Chapter 4 Review #97*

4.6.2 Given the initial population and the population at a later year, determine how long it will take for the population to reach a certain number if the growth rate remains the same. *Chapter 4 Review #98*

4.6.3 Given the half-life of a substance, determine the decay rate and how long it will take until the initial amount decays to another amount. *Chapter 4 Review #99 and 100*

4.6.4 Given formulas involving exponential functions and log functions such as Newton's Law of Cooling, along with the values of the variables in the formulas, be able to determine the unknowns using logs and exponential expressions. *Section 4.5 #102, Section 4.6 #26*

4.7 LOGARITHMIC SCALES

4.7.1 Explain what a PH scale measures, what a Richter scale measures, and what a decibel scale measures.

4.7.2 Solve PH scale, Richter scale, and decibel applications. *Section 4.7 #1, 4, 8, 10, 12, 16, and 18*

CHAPTER 5 TRIGONOMETRIC FUNCTIONS: UNIT CIRCLE APPROACH

The student shall be able to:

5.1 THE UNIT CIRCLE

5.1.1 Express the equation of the unit circle. *Chapter 5 Review Concept Check #1(a).*

5.1.2 Determine whether a coordinate pair is on the unit circle. *Chapter 5 Review #1 and 2 (a).*

5.1.3 List the special values of the terminal point at the respective distances of 0, pi/6, pi/4, pi/3 and pi/2 from the coordinate pair (0.1). *Section 5.1, Page 404, Table 1.*

5.1.4 Find the reference number, as needed, within the process of determining the terminal point. *Chapter 5 Review #3 - 6 (a).*

5.1.5 Use a calculator to determine the terminal point on the unit circle for positive or negative distances around the unit circle starting at the coordinate pair (0,1). *Chapter 5 Review #3 - 6 (b); Chapter 5.1 #47, 49, 51, 55 and 57.*

5.2 TRIGONOMETRIC FUNCTIONS OF REAL NUMBERS

5.2.1 Define the six trigonometric functions in relation to the terminal point on the unit circle. *Chapter 5 Review Concept Check #2(a).*

5.2.2 Assess the quadrant-based sign (+/-) for each trigonometric function. *Chapter 5 Review Concept Check #2(b).*

5.2.3 List the special values of the sine, cosine and tangent functions at the respective distances of 0, pi/6, pi/4, pi/3 and pi/2 from the coordinate pair (0.1). *Chapter 5 Review Concept Check # 2(c).*

5.2.4 Evaluate a trigonometric function for a real number by finding the reference number, the sign and the value. *Chapter 5 Review #3, 5, 7, 8, 11, 13 and 15.*

5.2.5 Express the Reciprocal/Ratio and Pythagorean fundamental identities, using them respectively to quantify trigonometric functions and to express one trigonometric function in terms of others. *Chapter 5 Review #17, 19, 21, 23, 25 and 27.*

5.2.6 Use a calculator to determine the approximate value of a trigonometric function for a distance around the unit circle from the coordinate pair (0.1). *Chapter 5 Review #9, 10 and 12.*

5.3 TRIGNOMETRIC GRAPHS (SINE AND COSINE)

5.3.1 Know the standard graphs of $f(x) = \sin(x)\ and\ f(x) = \cos(x)\ in\ the\ interval\ [0,2\pi)$. *Section 5.3 Concepts #1, Chapter 5.3 Pages 420 - 421, Figures 2 and 3.*

5.3.2 Understand the meaning of amplitude, period, and phase shift by identifying them in the functions $f(x) = a\sin(bx + c)\ or\ f(x) = a\cos(bx + c)$. *Section 5.3 #33, 35, 37 and 39.*

5.3.3 Graph one or two periods of the functions $f(x) = a\sin(bx + c)\ or\ f(x) = a\cos(bx + c)$, using the amplitude, period, and phase shift. *Section 5.3 #33, 35, 37 and 39.*

5.3.4 Translate the transformation of a sine or cosine function into standard form, which will be used to define the key attributes (e.g., amplitude, period, phase (horizontal) shift) essential to then graph the transformation for one or more cycles of the function. *Chapter 5 Review #33, 34, 35, 36, 53 and 54.*

5.3.5 Determine the mathematical sine or cosine function based on the graph of the function. *Chapter 5 Review #37 and 39.*

5.3.6 Solve application problems that relate to determining the key attributes and graphing of the sine or cosine function. *Section 5.3 #83 - 86.*

5.3.7 Use a graphing device to graph one or more cycles of the sine and cosine functions. *Section 5.3 #55 and 57.*

5.4 TRIGNOMETRIC GRAPHS (TANGENT, COTANGENT, SECANT, COSECANT)

5.4.1 Manually graph the basic tangent, cotangent, secant and cosecant function for one or more cycles of the function. *Chapter 5 Review Concept Check #8(a), 9(a).*

5.4.2 Translate the transformation of a function into standard form, which will be used to define the key attributes, as applicable (e.g., amplitude, period, phase (horizontal) shift, asymptote) essential to then graph the transformation for one or more cycles of the function. *Chapter 5 Review #43, 45 and 47.*

5.5 INVERSE TRIGNOMETRIC FUNCTIONS AND THEIR GRAPHS

5.5.1 Understand the inverse trigonometric function based on interchanging the x and y values of the function after restricting the domain, as applicable. *Section 5.5 Concepts #1.*

5.5.2 Define and evaluate exactly the inverse of the sine, cosine and tangent function. *Section 5.5 #3, 5 and 7.*

5.5.3 Use a calculator to approximate the value of an inverse trigonometric. *Section 5.5 #11, 13 and 17.*

CHAPTER 6 TRIGONOMETRIC FUNCTIONS: RIGHT TRIANGLE APPROACH

The student shall be able to:

6.1 ANGLE MEASURE

6.1.1 Convert degree measure to radian measure. *Chapter 6 Review #1 - 2.*

6.1.2 Convert radian measure to degree measure. *Chapter 6 Review #3 - 4.*

6.1.3 Demonstrate understanding of "angles in standard position" by putting angles in standard position. *Section 6.1 Page 473 Figure 5.*

6.1.4 Find the measure of coterminal angles and those in standard position. *Section 6.1 #29, 31, 35 and 37.*

6.1.5 For an angle greater than 360 degrees, find the coterminal angle between 0 and 360 degrees. *Section 6.1 #4 and 46.*

6.1.6 For an angle greater than 2pi, find the coterminal angle between 0 and 2pi. *Section 6.1 #47, 51 and 52.*

6.1.7 Determine the length of a circular arc, measure of central angle or radius based on formula $s = r\theta$ and given information provided. *Chapter 6 Review #5 - 7.*

6.1.8 Determine the area of a circular sector, measure of central angle or radius based on formula $A = \frac{1}{2}r^2\theta$ and given information provided. *Chapter 6 Review #11 - 14.*

6.2 TRIGONOMETRY OF RIGHT TRIANGLES

6.2.1 Understand the definitions of trigonometric functions based on the ratios of right triangles by finding the values of the functions given two sides of a right triangle. *Chapter 6 Review #17 - 18.*

6.2.2 List the special values of the sine, cosine and tangent functions at the respective degree central angles of 0, 30, 45, 60 and 90. *Chapter 6 Review Concept Check #4(d).*

6.2.3 Use a calculator to approximate the values of a trigonometric function. *Section 6.2 #11 and 13.*

6.2.4 Find the length of the other side(s) of a right triangle given the measure of an angle and the length of one side. *Chapter 6 Review #19,21,23 and 25.*

6.2.5 Solve application problems that relate to "line of sight" (angle of elevation or angle of depression) based on a single right triangle. *Section 6.2 #56,57 and 58.*

6.2.6 Solve application problems that relate to “line of sight” (angle of elevation or angle of depression) based on a double right triangle. *Chapter 6 Review #32.*

6.2.7 Solve application problems that relate to “line of sight” (angle of elevation or angle of depression) based on double right triangles requiring solving equations in two unknown variables. *Section 6.2 #60 and 66.*

6.3 TRIGONOMETRIC FUNCTIONS OF ANGLES

6.3.1 Define the six trigonometric functions in relation to the central angle (Put in standard position), a point on the terminal side of the angle and the radius (hypotenuse). *Chapter 6 Review Concept Check #6.*

6.3.2 Assess the quadrant-based sign (+/-) for each trigonometric function. *Chapter 6 Review Concept Check #7.*

6.3.3 Find the reference angle, as needed, within the process of determining the value of a trigonometric function. *Section 6.3 #5,7,8 and 9.*

6.3.4 Quantify the exact values of trigonometric functions. *Chapter 6 Review #33-38,45 and 46*

6.3.5 Express one trigonometric function in terms of others based on a right triangle. *Chapter 6 Review # 49, 51, 53, 55, 57 and 59.*

6.3.6 Apply the trigonometric formula for the area of a triangle based on the formula $A = \frac{1}{2}absin(\theta), where\ a\ and\ b\ are\ lengths\ of\ a\ traingle\ encompaing\ angle\ \theta$. *Section 6.3 #57, 59 and 63.*

6.4 INVERSE TRIGONOMETRIC FUNCTIONS AND RIGHT TRIANGLES

6.4.1 Find the exact value of the inverse of a trigonometric function. *Chapter 6 Review #61 and 62.*

6.4.2 Find the exact value of a composite function between a trigonometric function and an inverse trigonometric function. *Chapter 6 Review #63 and 64.*

6.4.3 Rewrite a composite function between a trigonometric function and an inverse trigonometric function as an algebraic expression in terms of one side of a right triangle. *Chapter 6 Review #65 and 66.*

6.4.4 Solve application problems for the angle of elevation or angle of depression based on the other given information. *Section 6.4 #41,42 and 43.*

6.5 THE LAW OF SINES

6.5.1 Know the Law of Sines and when it applies to problem. *Section 6.5 Concepts #1.*

6.5.2 Know the four cases in which we can solve the triangle. ASA, SSA, SAS and SSS

6.5.3 Know the four cases in which we can solve the triangle using Laws of Since and which will

lead to ambiguous case. *Section 6.5 Concepts #2.*

6.5.3 Sketch the triangle and then use Laws of Sines to solve the triangle. *Section 6.6 #14*

6.5.4 Apply the Law of Sines to determine the angle measure for a triangle. *Section 6.5 #29.*

6.5.5 Apply the Law of Sines to determine the side for a triangle. *Section 6.5 #30.*

6.5.6 Solve application problems using the Law of Sines. *Section 6.6 #32, 33 and 39.*

6.6. THE LAW OF COSINES

6.2.1 Know the Law of Cosines and when it applies to a problem. *Section 6.6 Concepts #1 - 2.*

6.2.2 Apply the Law of Cosines to determine the side length of a triangle. *Section 6.6 #3,4,6 and 9*

6.2.3 Apply the Law of Cosines to determine the angle measure for a triangle. *Section 6.6 #7,8 and 10.*

6.2.4 Solve application problems using the Law of Cosines. *Chapter 6 Review #79, 81 and 82.*

CHAPTER 7 ANALYTIC TRIGONOMETRY

The student shall be able to:

7.1 TRIGONOMETRIC IDENTITIES

7.1.1 Know what is an identity? What is a trigonometric identity? *Chapter 7 Review Concept Check #1*

7.1.2 Know the fundamental identities such as the Reciprocal Identities, the Pythagorean Identities, the Even-Odd Identities, and the Cofunction identities. *Chapter 7 Review Concept Check #2) and #3 a)-c)*

7.1.3 Know what a simplified trigonometric expression means. *See page 538, 7.1 bottom of page*

7.1.4 Simplify trigonometric expressions. *Section 7.1 #17, 18 and 22*

7.1.5 Prove trigonometric identities using the fundamental identities. *Chapter 7 Review Exercises # 1, 2, 4 and 5*

7.1.6 Check identities graphically using a graphing calculator. *Chapter 7 Review Exercises # 23 and 24*

7.2 THE ADDITION AND SUBTRACTION FORMULAS

7.2.1 Use the addition and subtraction formulas for sine and cosine to get exact values. (The tangent can be found by the quotient $\sin x / \cos x$) *Section 7.2 #1 and 2*

7.2.2 Find the sine of the sum or difference of two angles exact using the standard angles pi/2. pi/3, pi/4, pi/6, and multiples of those angles. *Chapter 7 Review Exercises # 50, 52, 59 and 60.*

7.2.3 Find the sine or cosine of the sum or difference of two angles exact using values of the sine and cosine of their component angles. *Chapter 7 Review Exercises #59 - 61*

7.2.4 Prove identities involving the sum and difference of two angles. *Section 7.2 #25 and 26*

7.3 DOUBLE ANGLE, HALF - ANGLE, AND PRODUCT-SUM FORMULAS

7.3.1 Know when to use double angle and half angle formulas. *Section 7.3 concept check #1 and 2.*

7.3.2 Use given trigonometric function value to find *sin(2x), cos(2x) and tan(2x) Section 7.3 # 4, 6 and 10.*

7.3.3 Know how to use half-angle formulas to find the exact values of the given expression. *Section 7.3 # 19 and 25.*

7.3.4 Know how to use addition-subtraction formulas to find the exact values of the given expression. *Section 7.3 # 17 and 18.*

7.3.5 Simplify the expression by using Double-Angle or Half-Angle formulas. *Section 7.3 #29, 32, 33 and 34.*

7.3.6 Find the value of *sin(x/2), cos(x/2)* and *tan(x/2)* from the given information. *Section 7.3 #37, 38, and 40.*

7.3.7 Evaluate each expression under the given conditions. *Section 7.3 #51, 52 and 54.*

7.3.8 Know how to use the lowering power formulas to rewrite the expression in terms of first power of cosine. *Section 7.3 #11 and 13.*

7.4 BASIC TRIGONOMETRIC EQUATIONS

7.4.1 Solve basic trigonometric equations accurate to 2 or 3 places (trig function = number) using the calculator and inverse trig functions. *Chapter 7 Review # 29 and 30*

7.4.2 Solve trigonometric equations EXACT requiring factoring in the interval [0, 2π). *Chapter 7 Review # 31 and 32*

7.4.3 Solve trigonometric equations requiring factoring accurate to 2 or 3 places in the interval [0, 2π). using the calculator and inverse trig function *Chapter 7 Review #29 and 30*

7.4.4 Solve for all values EXACT, trigonometric equations requiring factoring. *Section 7.4 #33, 34*

7.5 MORE TRIGONOMETRIC EQUATIONS.

7.5.1 Solve trigonometric equations after converting the equation into one trigonometric function. *Section 7.5 #2 and 4.*

7.5.2 Solve trigonometric equations by using double angle formulas *Section 7.5 #9*

7.5.3 Solve trigonometric equation involving a multiple of an angle over the interval $[0, 2\pi)$ and then find all the solutions. *Section 7.5 #17 and 21.*

7.5.4 Solve trigonometric equation by factoring by grouping. *Section 7.5 #31 and 32.*

7.5.5 Use graphing device to solve trigonometric equations. *Section 7.5 #59 and 60*