

## SEM 2 Objectives

### Unit 3: Laws of Exponents and Operations with Radicals

#### (A) Products of Powers

- Be able to define exponents and powers
- Be able to write numbers as exponential expressions
- Find products of powers:  $x^m \cdot x^n = x^{m+n}$
- Simplify products of exponential expressions

#### (B) Powers and Products

- Be able to find the power of a power:  $(x^m)^n = x^{mn}$
- Be able to find the power of a product:  $(xy)^n = x^n y^n$
- Understand the effect of powers on negative numbers:  $(-1)^{\text{even}} = 1$  and  $(-1)^{\text{odd}} = -1$

#### (C) Dividing Exponential Expressions

- Be able to simplify quotients (division) of powers:  $\frac{x^m}{x^n} = x^{m-n}$
- Be able to simplify powers of fractions:  $\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}, b \neq 0$

#### (D) Negative and Zero Exponents

- Be able to understand the concept of negative exponents:  $x^{-n} = \frac{1}{x^n}$  or  $\left(\frac{a}{b}\right)^{-n} = \left(\frac{b}{a}\right)^n$
- Know that any number (except zeros) is equal to 1 when raised to a power of zero.
- Be able to simplify expressions which contain negative and zero exponents

#### (E) Operations with Radicals

- Be able to identify or estimate square roots
- Be able to define and write square roots in simplest radical form
- Be able to combine with Radicals by using either multiplication or division.
- Understand how to work with expressions involving integers and radicals.

#### (F) Scientific Notation and Significant Figures

- Be able to add, subtract, multiply and divide when using Scientific Notation
- Understand the concept of Significant Figures
- Be able to write numbers to a required number of Significant Figures

### Unit 4: Polynomials and Factoring

#### (A) Adding and Subtracting Polynomials

- Know the terms: polynomial, monomial, degree, binomial, trinomial, and standard form of a polynomial.
- Be able to add and subtract polynomials.

#### (B) Multiplying Binomials

- Be able to find products of binomials through distributing.
- Be able to mentally multiply binomials.

#### (C) Common Factors

- Be able to factor a polynomial by finding the greatest common factor between terms.

<ul style="list-style-type: none"> <li>○ Be able to factor a polynomial by finding a common binomial factor.</li> </ul>			
<b>(D) Factoring and Special Polynomials</b> <ul style="list-style-type: none"> <li>○ Be able to identify perfect square trinomials and a difference of squares.</li> <li>○ Be able to <b>factor</b> perfect square trinomials and factor a difference of squares.</li> </ul>			
<b>(E) Factoring Quadratic Trinomials</b> <ul style="list-style-type: none"> <li>○ Be able to factor quadratic trinomials</li> <li>○ Be able to factor by grouping.</li> </ul>			
<b>(F) Solving Equations by Factoring</b> <ul style="list-style-type: none"> <li>○ Be able to solve quadratic equations by factoring</li> <li>○ Be able to find the zeros of a quadratic.</li> </ul>			

## Unit 5: Trigonometry

<b>(A) Tangent</b> <ul style="list-style-type: none"> <li>○ Know how to find the tangent ratio for an angle using side lengths in a right triangle.</li> <li>○ Given an angle measure, be able to use your calculator to find a decimal value for the tangent ratio.</li> <li>○ Given the tangent ratio, be able to use your calculator to find the angle measure in degrees.</li> <li>○ Given the length of one leg of a right triangle and one other angle, know how to write and solve an equation to find the length of the other leg.</li> </ul>			
<b>(B) Sines and Cosines</b> <ul style="list-style-type: none"> <li>○ Know how to find the sine and cosine ratios for an angle in a right triangle using the ratio of appropriate sides.</li> <li>○ Given an angle measure, be able to use your calculator to find a decimal value for the sine or cosine ratio.</li> <li>○ Given the sine or cosine ratio, be able to use your calculator to find the angle measure in degrees.</li> <li>○ Given an angle and the length of a leg of a right triangle, be able to find the length of the hypotenuse using either sine or cosine.</li> <li>○ Given an angle and the length of the hypotenuse of a right triangle, be able to find the length of either leg. Use sine or cosine.</li> <li>○ Given the length of a leg and hypotenuse in a right triangle, be able to find the measure of the angles in the triangles.</li> </ul>			
<b>(C) Applications</b> <ul style="list-style-type: none"> <li>○ Be able to determine when to use each of the trigonometric ratios (sin, cos, or tan).</li> <li>○ Know the terms angle of elevation and angle of depression.</li> <li>○ Be able to solve word problems by drawing a well labeled diagram and using trig ratios.</li> </ul>			

## Unit 6: Congruency & Similarity

<b>(A) Congruent Polygons</b> <ul style="list-style-type: none"> <li>○ What are congruent polygons</li> <li>○ Be able to name congruent polygons and identify the corresponding sides and angles within the name.</li> </ul>			
<b>(B) Triangle Congruence</b> <ul style="list-style-type: none"> <li>○ Know and be able to apply the three triangle congruence postulates: Side-Side-Side (SSS), Side-Angle-Side (SAS), and Angle-Side-Angle (ASA).</li> </ul>			
<b>(C) Analyzing Triangle Congruence</b> <ul style="list-style-type: none"> <li>○ Be able to identify when to use the SSS, SAS, or ASA to show triangles are congruent.</li> <li>○ Know and be able to apply two more triangle congruence theorems: Angle-Angle-Side (AAS), and Hypotenuse-Leg (HL).</li> <li>○ Understand why AAA, and SSA do not work to show triangle congruence.</li> </ul>			

<p><b>(D) Using Triangle Congruence</b></p> <ul style="list-style-type: none"> <li>○ Be able to use congruence of triangles to conclude congruence of corresponding parts. (CPCTC)</li> <li>○ Develop and use the isosceles Triangle Theorem.</li> </ul> <p><b>(E) Similar Polygons</b></p> <ul style="list-style-type: none"> <li>○ Know what it means for polygons to be similar. What is the relationship between the sides and angles?</li> <li>○ Be able to write and solve proportions to find missing quantities.</li> </ul>			
<p><b>(F) Triangle Similarity</b></p> <ul style="list-style-type: none"> <li>○ Be able to determine when triangles are similar.</li> <li>○ Know three different ways to show that triangles are similar.</li> </ul>			
<p><b>(G) The Side-Splitting Theorem</b></p> <ul style="list-style-type: none"> <li>○ Know the Side-Splitting Theorem</li> <li>○ Be able to write and solve proportions to find missing quantities.</li> </ul>			

## Unit 7: Area and Volume

<p><b>(A) Perimeter and Area</b></p> <ul style="list-style-type: none"> <li>○ Be able to find the perimeter of a polygon.</li> <li>○ Know how to find the perimeter and area of rectangles.</li> <li>○ Be able to write and solve equations with verbal descriptions of dimensions and properties of rectangles.</li> <li>○ Be able to solve application problems.</li> </ul>			
<p><b>(B) Areas of Triangles, Parallelograms &amp; Trapezoids</b></p> <ul style="list-style-type: none"> <li>○ Be able to identify parts of a triangle and parallelogram: altitude, height and base.</li> <li>○ Develop and apply the formulae for the area of a triangle, parallelogram to solve problems.</li> </ul>			
<p><b>(C) Circumferences and Areas of Circles</b></p> <ul style="list-style-type: none"> <li>○ Be able to identify parts of a circle: center, radius, and diameter.</li> <li>○ Know the formula for the circumference and area of a circle.</li> <li>○ Be able to use the formulae for circumference and area to solve problems involving circles</li> </ul>			
<p><b>(D) Surface Area and Volume of Prisms</b></p> <ul style="list-style-type: none"> <li>○ Be able to identify the altitude of a right prism.</li> <li>○ Know how to draw a net for a prism.</li> <li>○ Know how to find the surface area and volume of right prisms.</li> </ul>			
<p><b>(E) Surface Area and Volume of Cylinders</b></p> <ul style="list-style-type: none"> <li>○ Be able to identify parts of a cylinder: bases, lateral surface, altitude.</li> <li>○ Be able to find the surface area of a right cylinder.</li> <li>○ Be able to find the volume of any cylinder.</li> </ul>			
<p><b>(F) Surface Area and Volume of Pyramids</b></p> <ul style="list-style-type: none"> <li>○ Be able to find the surface area of a regular pyramid.</li> <li>○ Be able to find the volume of any pyramid.</li> </ul>			
<p><b>(G) Surface Area and Volume of Cones</b></p> <ul style="list-style-type: none"> <li>○ Know the formula for the surface area of a right cone.</li> <li>○ Know the formula for the volume of any cone.</li> </ul>			
<p><b>(H) Surface Area and Volume of Spheres</b></p> <ul style="list-style-type: none"> <li>○ Know and be able to use the formula for the surface area of a sphere.</li> <li>○ Know and be able to use the formula for the volume of a sphere.</li> </ul>			