

### Expectations

- 1.1 The student will represent functions and relations numerically, graphically, and algebraically.
- 1.2 The student will describe and apply properties of functions and relations.
- 1.3 The student will perform a variety of operations and geometrical transformations on functions and relations.
- 1.4 The student will use numerical, algebraic, and graphical representations of functions and relations in order to solve real-world problems.
- 2.1 The student will analyze two- and three-dimensional figures using tools and technology when appropriate.
- 2.2 The student will apply geometric properties and relationships to solve problems using tools and technology when appropriate.

### Essential Questions

How do trigonometric and circular functions model real-world problems and their solutions?

How are the circular functions related to the trigonometric functions?

### Enduring Understanding

The characteristics of trigonometric and circular functions and their representations are useful in solving real-world problems.

### Indicators

- 1.1.PC.15 determine the period, amplitude, phase shift, and/or vertical shift of a trigonometric function represented graphically or algebraically.
- 1.2.PC.3 describe the properties of linear, quadratic, power, polynomial, rational, exponential, logarithmic, trigonometric, and inverse trigonometric functions.
- 1.2.PC.5 describe the inverse relationship between trigonometric and inverse trigonometric functions, numerically, algebraically, and graphically.
- 1.2.PC.6 identify and distinguish between the graphs of linear, quadratic, power, polynomial, rational, exponential, logarithmic, trigonometric, and inverse trigonometric functions.
- 1.3.PC.4 describe the effect of transformations on the graphs of trigonometric functions.
- 1.4.PC.10 interpret and solve problems involving trigonometric functions.
- 1.4.PC.12 make predictions using trigonometric or power mathematical models given a set of data.
- 2.1.PC.4 describe and apply the relationship between the trigonometry of the right triangle and the unit circle.
- 2.1.PC.5 describe and apply the relationship between the radian measure of a central angle of a circle and its intercepted arc.
- 2.1.PC.8 define and graph the six circular functions.
- 2.2.PC.1 write the value of an inverse trigonometric expression in radians.
- 2.2.PC.4** *determine the angular and linear velocities of an object moving at a constant speed on a circular path.*
- 2.2.PC.5 evaluate a trigonometric expression using radian measure.
- 2.2.PC.6 convert degree measure to radian measure.
- 2.2.PC.7 measure indirectly using trigonometric relationships.