

Extend the domain of trigonometric functions using the unit circle (F.TF.1-3)	
Standard III.F.TF.1: Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle.	
Concepts and Skills to Master	
<ul style="list-style-type: none"> • Define a radian as the length of the arc on the unit circle subtended by the angle. • Locate radian measures on the unit circle. • Find length of an arc on the unit circle and relate it to radian measure. • Sketch a given radian measure on the unit circle. 	
Related Standards: Current Course	Related Standards: Future Courses
III.F.TF.2 , III.F.TF.3 , III.F.TF.5 , III.F.TF.7	P.F.TF.4, P.TF.6, P.TF.7

Support for Teachers

Critical Background Knowledge
<ul style="list-style-type: none"> • Prove that all circles are similar (II.G.C.1) • Derive the fact that the length of an arc is proportional to the radius (II.G.C.5)
Academic Vocabulary
radian, unit circle, subtended, central angle, arc, arc length
Resources
Curriculum Resources : http://www.uen.org/core/core.do?courseNum=5630#71615

Extend the domain of trigonometric functions using the unit circle (F.TF.1-3)	
Standard III.F.TF.2: Explain how the unit circle in the coordinate plane enables the extension of trigonometric functions to all real numbers, interpreted as radian measures of angles traversed counterclockwise around the unit circle.	
Concepts and Skills to Master	
<ul style="list-style-type: none"> Recognize that the coordinates of any point on the unit circle may be defined as $(\cos \theta, \sin \theta)$. Recognize that $\tan \theta = \sin \theta / \cos \theta$. Given a point on the coordinate grid, find the measure of the angle and state the trigonometric ratios for that angle. Graph trigonometric functions, for example, connecting the function $f(\theta) = \sin(\theta)$ to the y-value (or height) of the ordered pair on the unit circle. 	
Related Standards: Current Course	Related Standards: Future Courses
III.F.TF.1 , III.F.TF.3 , III.F.TF.5 , III.F.TF.7 , III.F.IF.7	P.F.TF.4, P.F.TF.6, P.F.TF.7, P.F.TF.9, P.N.CN.4, P.N.CN.5, P.N.CN.6, P.NCN.10


Support for Teachers

Critical Background Knowledge
<ul style="list-style-type: none"> Understand radian measure (III.F.TF.1) Define trigonometric ratios (II.G.SRT.6) Use trigonometric ratios to solve problems (II.G.SRT.8) Relate the domain of a function to its graph (II.F.IF.5)
Academic Vocabulary
co-terminal angles, reference angle
Resources
Curriculum Resources : http://www.uen.org/core/core.do?courseNum=5630#71615

Extend the domain of trigonometric functions using the unit circle (F.TF.1-3)	
Standard III.F.TF.3: Use special triangles to determine geometrically the values of sine, cosine, tangent for $\pi/3$, $\pi/4$ and $\pi/6$, and use the unit circle to express the values of sine, cosine, and tangent for $\pi - x$, $\pi + x$, and $2\pi - x$ in terms of their values for x , where x is any real number.	
Concepts and Skills to Master	
<ul style="list-style-type: none"> • Use similarity to determine the side measures of $30^\circ-60^\circ-90^\circ$ and $45^\circ-45^\circ-90^\circ$ triangles. • Find the values of sine, cosine, and tangent in the special right triangles using degree and radian measures. • Understand and use reference angles on the unit circle. 	
Related Standards: Current Course	Related Standards: Future Courses


Support for Teachers

Critical Background Knowledge
<ul style="list-style-type: none"> • Understanding that trigonometric ratios are defined by acute angles in similar triangles (II.G.SRT.6) • Using trigonometric ratios and the Pythagorean Theorem to solve right triangles (II.G.SRT.8)
Academic Vocabulary
domain, reference angle, angle of rotation, co-terminal, initial side, terminal side, sine, cosine, tangent
Resources
Curriculum Resources : http://www.uen.org/core/core.do?courseNum=5630#71615

Model periodic phenomena with trigonometric functions (F.TF.5,7)	
Standard III.F.TF.5: Choose trigonometric functions to model periodic phenomena with specified amplitude, frequency, and midline. 	
Concepts and Skills to Master	
<ul style="list-style-type: none"> • Graph trigonometric parent functions. • Identify the amplitude, frequency, period, and midline given either an equation or a graph of a trigonometric function. • Use trigonometric functions to model real-world problems. 	
Related Standards: Current Course	Related Standards: Future Courses

Support for Teachers

Critical Background Knowledge
<ul style="list-style-type: none"> • Transformations of a parent graph (I.F.BF.3 and II.F.BF.3) • Knowledge of unit circle trigonometry (III.F.TF.2)
Academic Vocabulary
periodic, amplitude, midline, frequency, period, phase shift
Resources
Curriculum Resources : http://www.uen.org/core/core.do?courseNum=5630#71615

Model periodic phenomena with trigonometric functions (F.TF.5,7)	
Standard III.F.TF.7: Use inverse functions to solve trigonometric equations that arise in modeling context; evaluate the solutions using technology and interpret them in terms of context. Limit solutions to a given interval. 	
Concepts and Skills to Master	
<ul style="list-style-type: none"> • Use inverse functions to solve trigonometric equations that arise in modeling contexts. • Interpret the solution using technology and determine if there are additional solutions. • Interpret the solution in terms of the context of the model. 	
Related Standards: Current Course	Related Standards: Future Courses

Support for Teachers

Critical Background Knowledge
<ul style="list-style-type: none"> • Inverse trigonometric functions. (IIH.F.TF.6) • Model periodic phenomena. (III.F.TF.5) • Solving trigonometric equations. (IIH)
Academic Vocabulary
Displacement, wave speed, frequency, harmonic motion, midline or equilibrium, periodic, inverse, sinusoidal
Resources:
Curriculum Resources : http://www.uen.org/core/core.do?courseNum=5630#71615