## **Trigonometry**

## Instructional Focus: Graph and transform trigonometric functions

	4 – Mastery	3 – Proficient	2 - Basic	1 – Below Basic	0 – No
Cummatri	Can extend	Lico the unit circle to evaluit	Use the unit circle to explain	Lico the unit circle to evaluit	Evidence Little
Symmetry and	thinking beyond	Use the unit circle to explain symmetry (odd and even) of	symmetry (odd and even) of	Use the unit circle to explain symmetry (odd and even) of	evidence
					of
periodicity of trigono-	the standard, including tasks	the six trigonometric functions.	the sine, cosine, <u>and</u>	the <u>sine and cosine</u> functions.	
, and the second	, and the second	Tunctions.	tangent functions.	Tunctions.	reasoning
metric	that may involve		lles the meniculisity, of the		Or annlination
functions	one of the	Use the periodicity of the	Use the periodicity of the	Use the periodicity of the	application to solve
(F.TF.4)	following:	unit circle to explain the	unit circle to explain the	unit circle to explain the	
		repeated cycle of the graphs	repeated cycle of the graphs	repeated cycle of the graphs	the
	<ul> <li>Designing</li> </ul>	of <u>all six</u> trigonometric	of sine, cosine, and tangent	of sine and cosine	problem
	<ul> <li>Connecting</li> </ul>	functions.	functions.	functions.	Does not
Identify	<ul> <li>Synthesizing</li> </ul>	Identify the effect on a	Identify the effect on a	Identify the effect on a	meet the
and Find	<ul> <li>Applying</li> </ul>	graph by replacing f(x) with	graph by replacing f(x) with	graph by replacing f(x) with	criteria in
Transfor-	<ul> <li>Justifying</li> </ul>	more than two	two transformations:	a single transformation:	a level 1
mations	<ul> <li>Critiquing</li> </ul>	transformations:	f(x) + k, k f(x), f(kx), f(x+k)	f(x) + k, k f(x), f(kx), f(x+k)	
(F.BF.3)	<ul> <li>Analyzing</li> </ul>	f(x) + k, k f(x), f(kx), f(x+k)	for specific positive and	for specific positive and	
	<ul> <li>Creating</li> </ul>	for specific positive and	negative values of k	negative values of k	
	<ul><li>Proving</li></ul>	negative values of k			
			Given the graph of a	Given the graph of a	
		Given the graph of a	function and <u>two</u>	function and a single	
		function and more than two	transformations, find the	transformation, find the	
		transformations, find the	values of the constants and	value of the constant or	
		values of the constants and	coefficients	coefficient	
		coefficients			
			Recognize even and odd	Recognize even and odd	
		Given a partial graph,	functions from graphs and	functions from graphs	
		complete the graph for	<u>equations</u>		
		both even and odd			
		functions			
Identify key		Graph trigonometric	<b>Graph</b> trigonometric	Given the graph or	
features of		functions, and interpret all	functions, and identify all	equation of trigonometric	
graphs		related key features of a	related key features of a	functions, identify all	
(F.IF.7)		graph in context of a real	graph.	related key features of a	
		world situation.	<ul> <li>asymptotes</li> </ul>	graph.	
		<ul> <li>asymptotes</li> </ul>	<ul><li>period</li></ul>	<ul> <li>asymptotes</li> </ul>	
		<ul><li>period</li></ul>	<ul> <li>midline</li> </ul>	<ul><li>period</li></ul>	
		<ul> <li>midline</li> </ul>	<ul> <li>amplitude</li> </ul>	<ul> <li>midline</li> </ul>	
		<ul> <li>amplitude</li> </ul>		<ul> <li>amplitude</li> </ul>	

Graphing F.TF.4 (+) Use the unit circle to explain symmetry (odd and even) and periodicity of trigonometric functions.

**F.BF.3 (+)** Identify the effect on the graph of replacing f(x) by f(x) + k, k f(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.

F.IF.7 Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. ★

e. (+) Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.