CCSS Algebra 4 Tangent on the Unit Circle

Recall that in a right triangle, $tan(θ)=\frac{opposite}{adjacent}$.

1. Explain why, if $θ$ is a rotation on the unit circle, $tan(θ)=\frac{sin(θ)}{cos(θ)}$. Be specific.



1. Use the unit circle to find:
	1. $tan(45^{o})$
	2. $tan(60^{o})$
	3. $tan(\frac{3π}{4})$
	4. $tan(270^{o})$
	5. $tan(\frac{7π}{6})$
	6. $tan(-45^{o})$
	7. $tan(-120^{o})$
	8. $tan(-π)$
2. Use the unit circle to solve each equation for $θ$:
	1. $tan(θ)=\sqrt{3}, 0\leq θ\leq 360$
	2. $tan(θ)=0, -π\leq θ\leq π$
	3. $tan(θ)=\infty , -360\leq θ\leq 0$

* 1. $tan(θ)=1, -360\leq θ\leq 720$

1. Fill in the following table. Use your answers to draw a graph of sine, cosine, and tangent.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| $θ$ | 0 | 30 | 45 | 60 | 90 |
| $cosθ$ |  |  |  |  |  |
| $sinθ$ |  |  |  |  |  |
| $tanθ$ |  |  |  |  |  |

|  |  |
| --- | --- |
| $y=cosθ$Domain:Range:Period: |  |
| $y=sinθ$Domain:Range:Period: |  |
| $y=tanθ$Domain:Range:Period: |  |

1. Explain, using the unit circle, why the y-intercept for cosine is (0,1), but the y-intercept for sine AND tangent is (0,0).

1. What Algebra 1/2 concept is equivalent to tangent? Why is the period for tangent DIFFERENT?