

Unit 6 Lesson 12: Tangent

1 Notice and Wonder: An Unusual Function (Warm up)

Student Task Statement

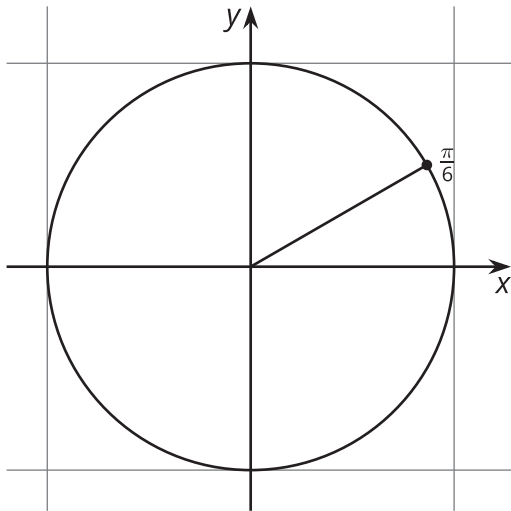
What do you notice? What do you wonder?

θ	$\cos(\theta)$	$\sin(\theta)$	$\tan(\theta)$
$-\frac{\pi}{2}$	0	-1	
$-\frac{\pi}{3}$	0.5	-0.87	
$-\frac{\pi}{6}$	0.87	-0.5	
0	1	0	
$\frac{\pi}{6}$	0.87	0.5	
$\frac{\pi}{3}$	0.5	0.87	
$\frac{\pi}{2}$	0	1	

2 A Tangent Ratio

Student Task Statement

- Complete the table. For each positive angle in the table, add the corresponding point and the segment between it and the origin to the unit circle.



θ	$\cos(\theta)$	$\sin(\theta)$	$\tan(\theta)$
$-\frac{\pi}{2}$	0	-1	
$-\frac{\pi}{3}$	0.5	-0.87	
$-\frac{\pi}{6}$	0.87	-0.5	
0	1	0	
$\frac{\pi}{6}$	0.87	0.5	
$\frac{\pi}{3}$	0.5	0.87	
$\frac{\pi}{2}$	0	1	
$\frac{2\pi}{3}$			
$\frac{5\pi}{6}$			
π			
$\frac{7\pi}{6}$			
$\frac{4\pi}{3}$			
$\frac{3\pi}{2}$			
$\frac{5\pi}{3}$			
$\frac{11\pi}{6}$			
2π			

- How are the values of $\tan(\theta)$ like the values of $\cos(\theta)$ and $\sin(\theta)$? How are they different?

3 The Tangent Function

Student Task Statement

Before we graph $y = \tan(\theta)$, let's figure out some things that must be true.

1. Explain why the graph of $\tan(\theta)$ has a vertical asymptote at $x = \frac{\pi}{2}$.
2. Does the graph of $\tan(\theta)$ have other vertical asymptotes? Explain how you know.
3. For which values of θ is $\tan(\theta)$ zero? For which values of θ is $\tan(\theta)$ one? Explain how you know.
4. Is the graph of $\tan(\theta)$ periodic? Explain how you know.

Images for Activity Synthesis

