

Schedule

1. Lesson - the Tangent Graph

2. Warm Up

3. Check Homework

HW →
HELP

Have your
GDC
ready

Aim
Today :

← NOTES

Analyze $f(\theta) = \tan \theta$

slope function

$$\tan \theta = \frac{\sin \theta}{\cos \theta}$$

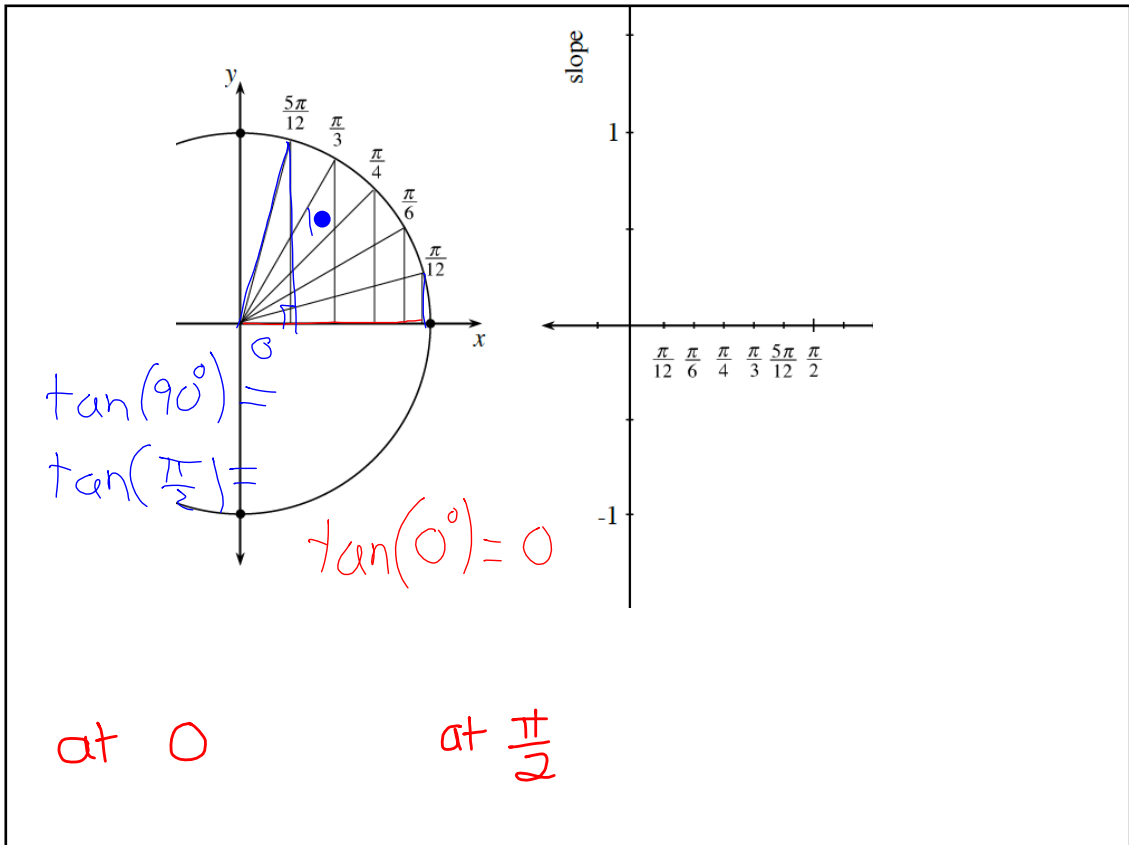
d

January 31, 2018

$$\frac{0}{1} = 0$$

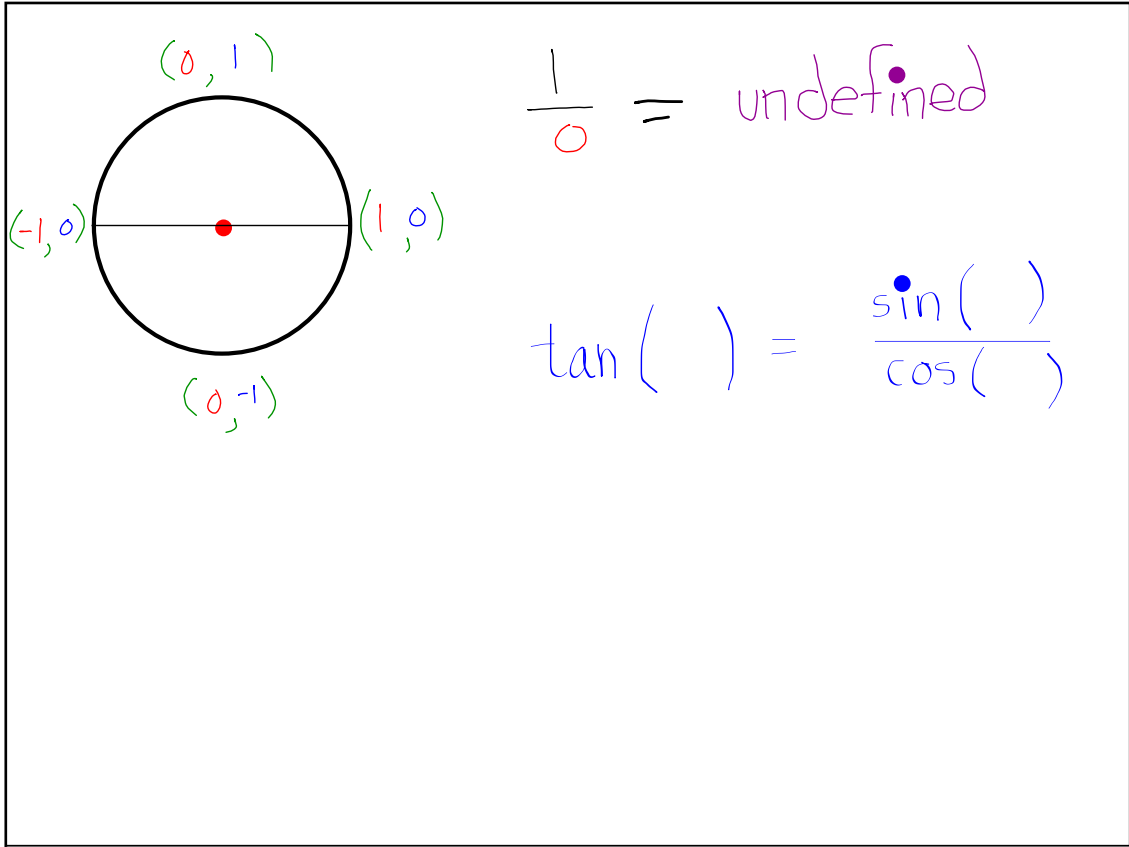
$$\frac{1}{0} = \text{undefined}$$

$$\frac{0}{-1} = 0$$



d

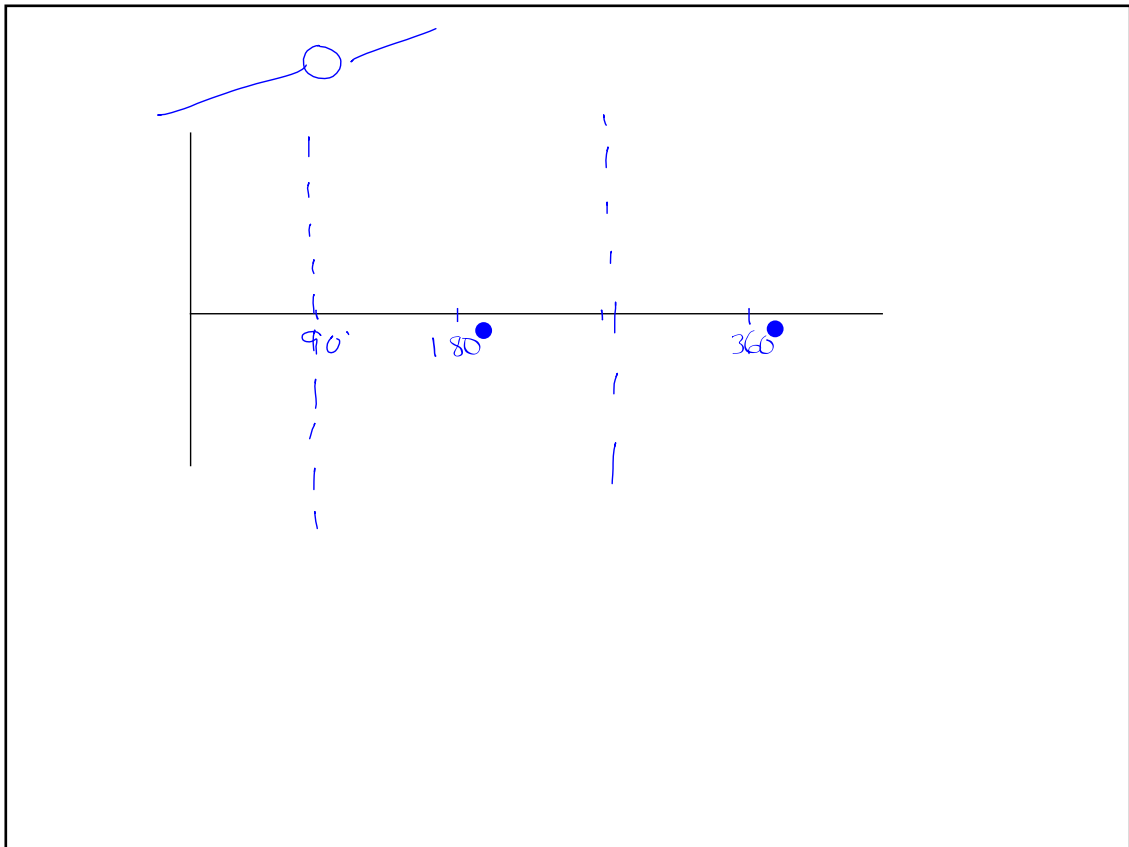
January 31, 2018



$(0, 1)$
 $(-1, 0)$ $(1, 0)$
 $(0, -1)$

$\frac{1}{0} = \text{undefined}$

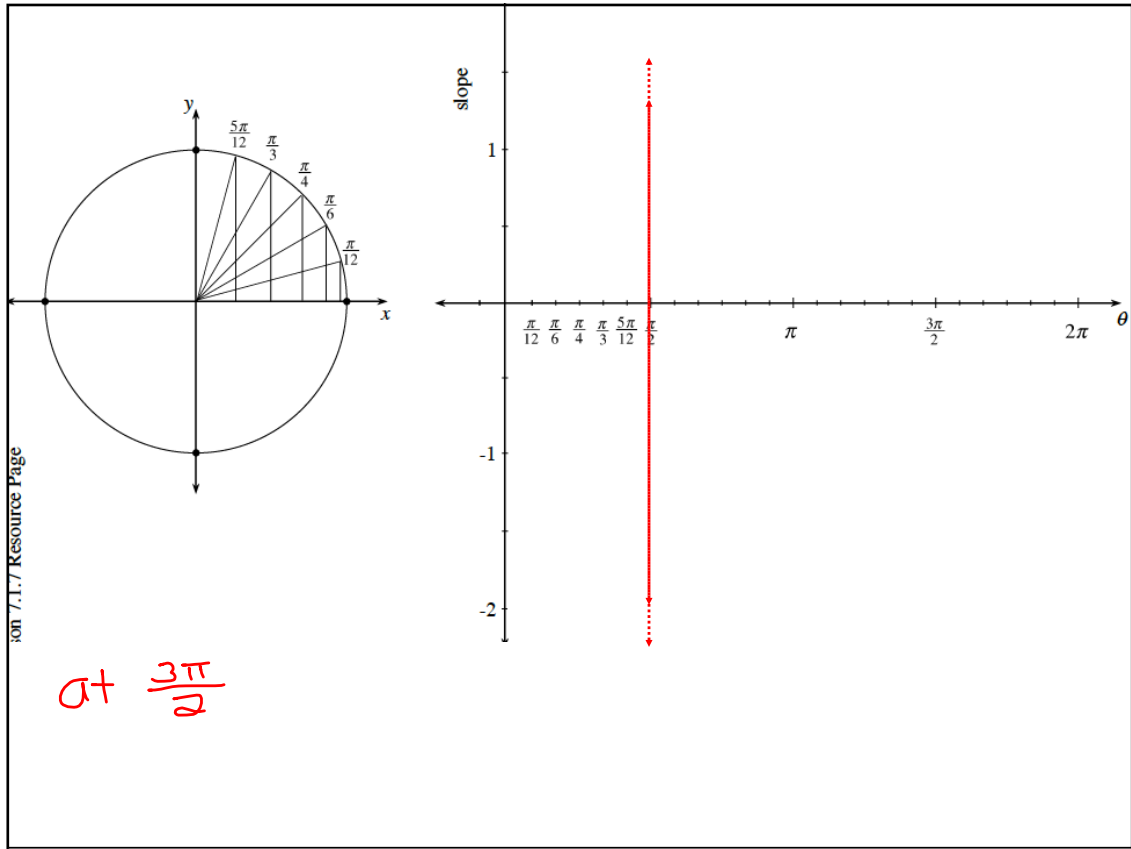
$\tan() = \frac{\sin()}{\cos()}$



90° 180° 360°

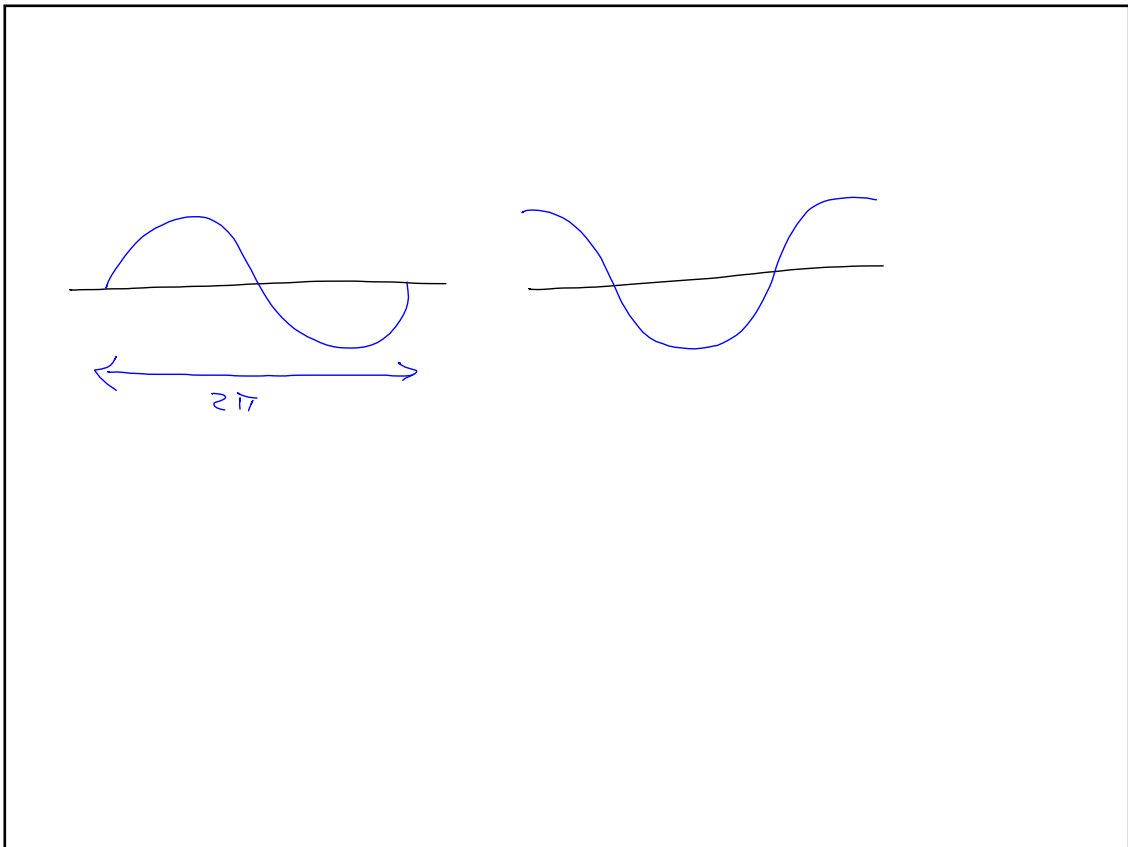
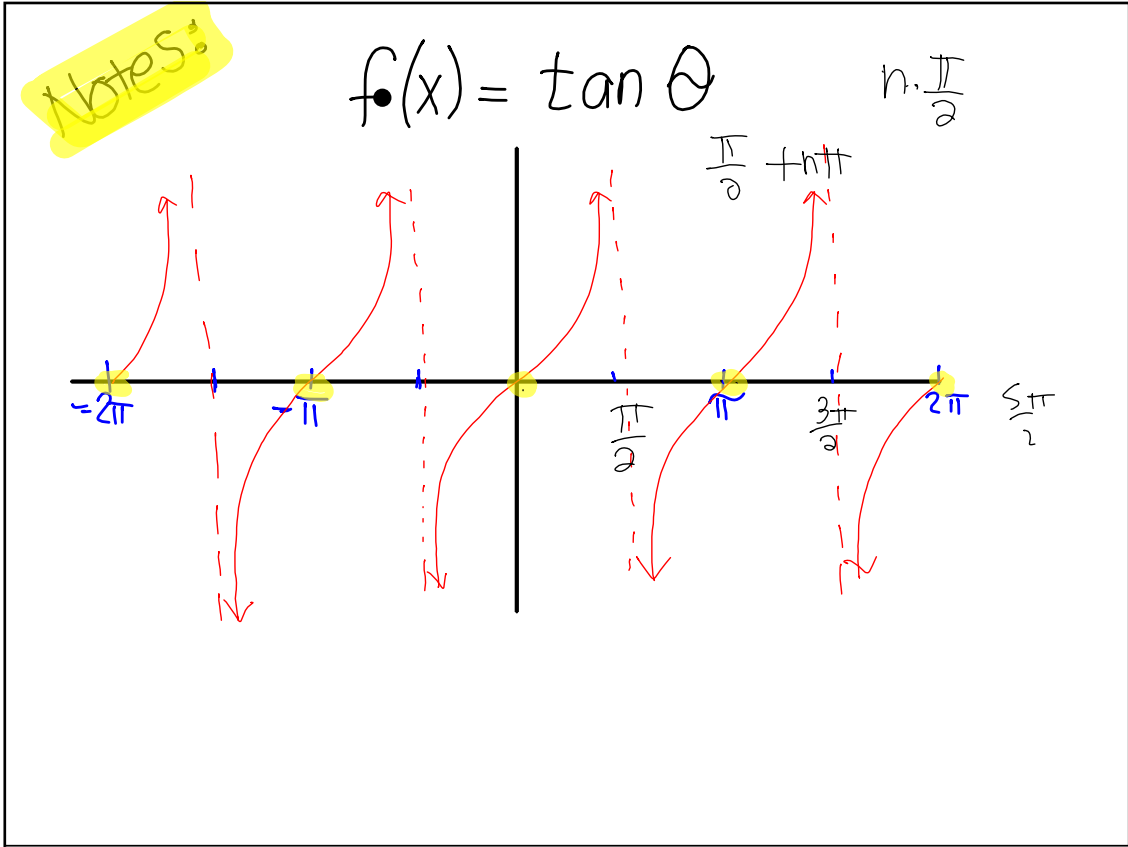
d

January 31, 2018



on GDC $\tan(x)$
degrees first $0^\circ < \theta < 360^\circ$

- ZOOM TRIG
- $\text{now radians } 0 < \theta < 2\pi$
- ZOOM TRIG



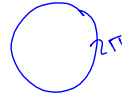
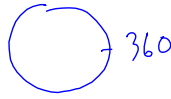
<u>radians</u>	<u>degrees</u>
$-\infty < \theta < \infty, \theta \neq \frac{\pi}{2} + m\pi$	$-\infty < \theta < \infty, \theta \neq 90^\circ + 180^\circ n$
Domain	Same
$-\infty < \tan(\theta) < \infty$	Same
Range	
$\theta = n\pi$	$\theta = 180^\circ n$
θ -intercepts	
Per = π	Per = 180
Period	
180° rotational symmetry	

Pick up the Warm Up

d

January 31, 2018

① 225°



$$\frac{360^\circ}{2\pi} \text{ or } \frac{2\pi}{360}$$

$$225^\circ \cdot \frac{2\pi}{360^\circ}$$

$$\approx 3.927 \text{ radians}$$

② 138.6°

$$138.6^\circ \times \frac{2\pi}{360} \approx 2.419 \text{ radians}$$

•

Convert to following angles to degrees

$$(3) \quad \frac{3\pi}{8} = \frac{360}{2\pi}$$

$$(4) \quad 3 \text{ radians}$$

$$= 67.5^\circ$$

$$3 \text{ rad} \cdot \frac{360^\circ}{2\pi} \approx 171.9^\circ$$

Assume θ is in quadrant III and you know that $\cos \theta = -\frac{4}{5}$

(5) Find the $\sin \theta$ without using a calculator

$$\cos^2 \theta + \sin^2 \theta = 1^2$$

$$\left(-\frac{4}{5}\right)^2 + \sin^2 \theta = 1$$

$$\frac{16}{25} + \sin^2 \theta = 1$$

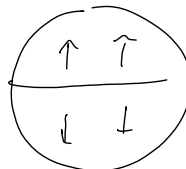
$$\sin^2 \theta = \frac{25}{25} - \frac{16}{25}$$

$$\sin^2 \theta = \frac{9}{25}$$

$$\sin^2 \theta = \frac{9}{25}$$

$$\sin \theta = \pm \frac{3}{5}$$

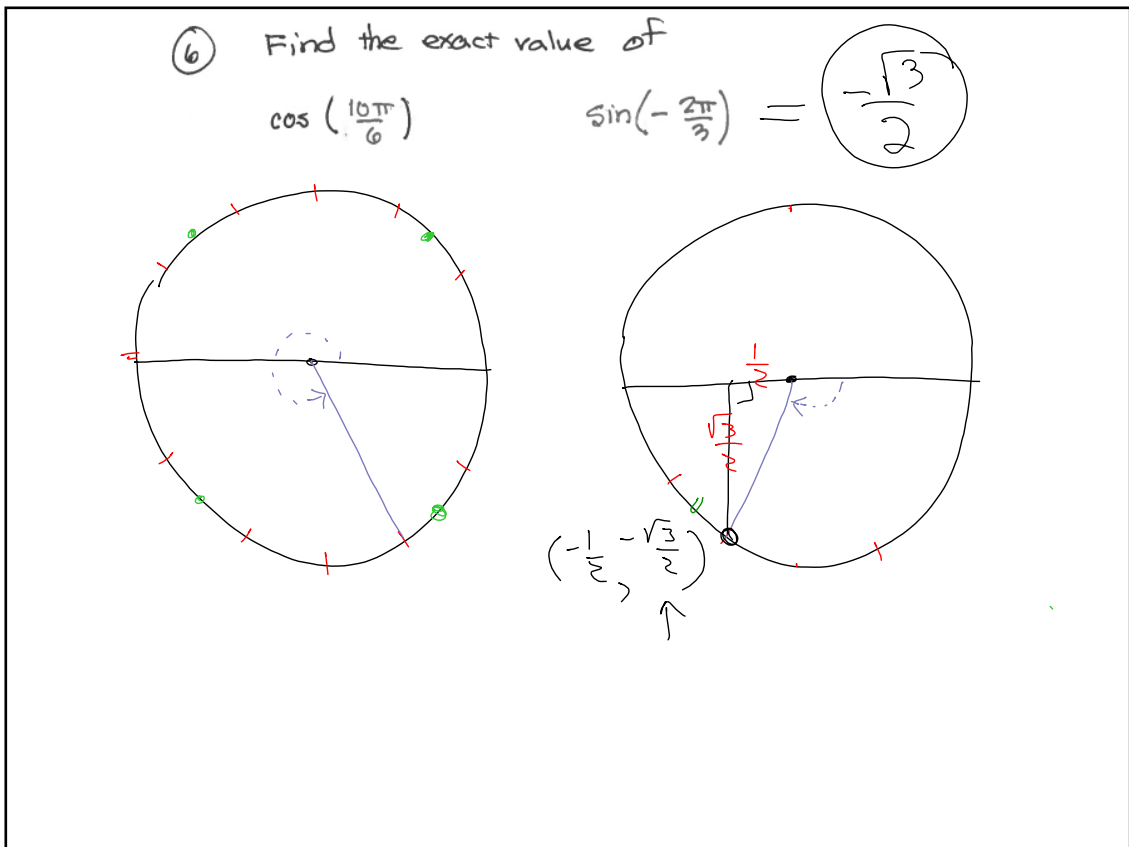
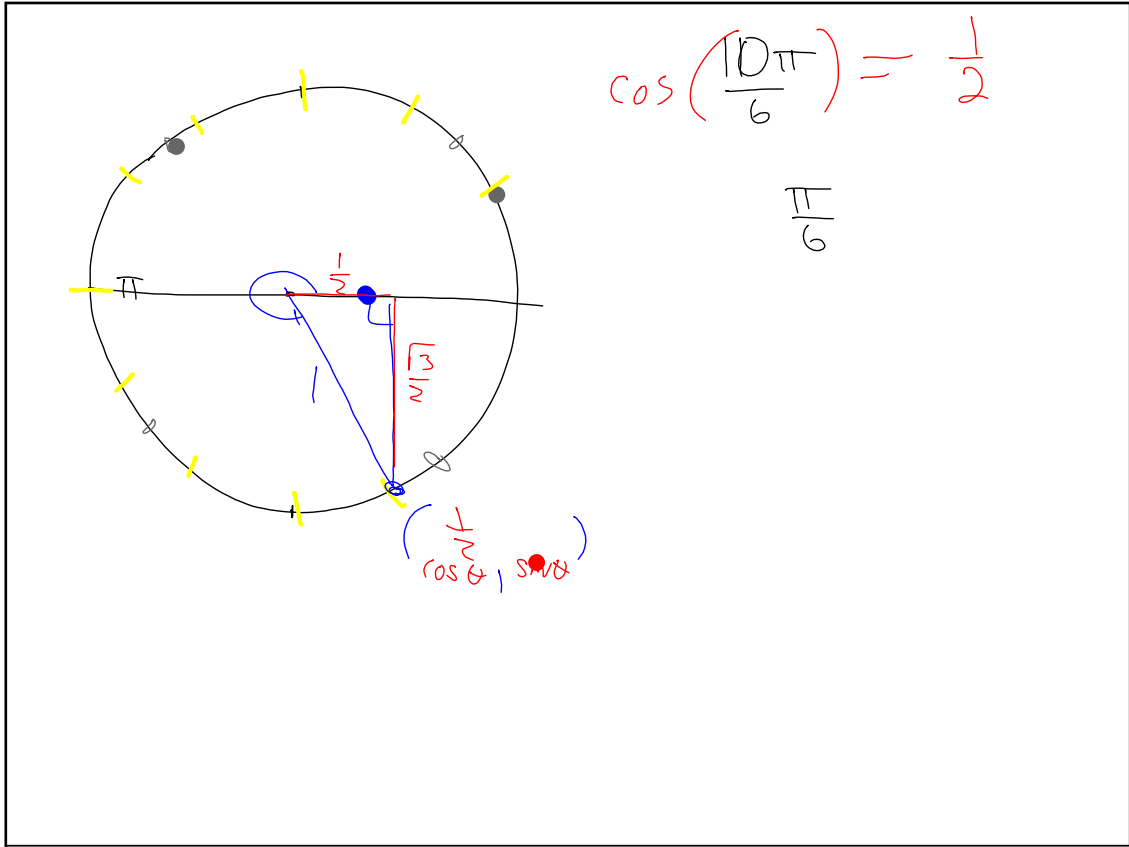
$$\sin \theta = -\frac{3}{5}$$



↑ ↓ quadrant III

d

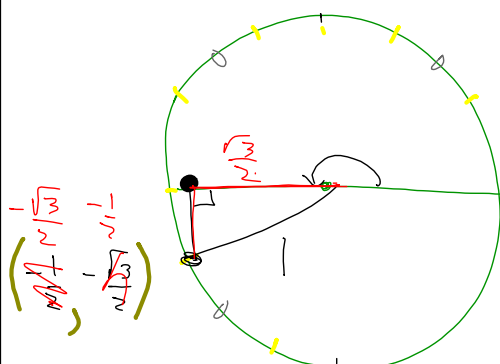
January 31, 2018



d

January 31, 2018

⑦ $\tan\left(\frac{7\pi}{6}\right) = \frac{\sin\left(\frac{7\pi}{6}\right)}{\cos\left(\frac{7\pi}{6}\right)} = \frac{-\frac{1}{2}}{\frac{\sqrt{3}}{2}}$



The diagram shows a unit circle with a point in the third quadrant. A red line segment from the origin to the point is labeled $\frac{\sqrt{3}}{2}$. A vertical red line segment from the point to the x-axis is labeled $-\frac{1}{2}$. A horizontal red line segment from the point to the y-axis is labeled $-\frac{\sqrt{3}}{2}$. A right-angle symbol is shown at the intersection of the vertical and horizontal red lines. The angle $\frac{7\pi}{6}$ is indicated by a curved arrow starting from the positive x-axis and ending at the point. The coordinates of the point are written as $(-\frac{\sqrt{3}}{2}, -\frac{1}{2})$.

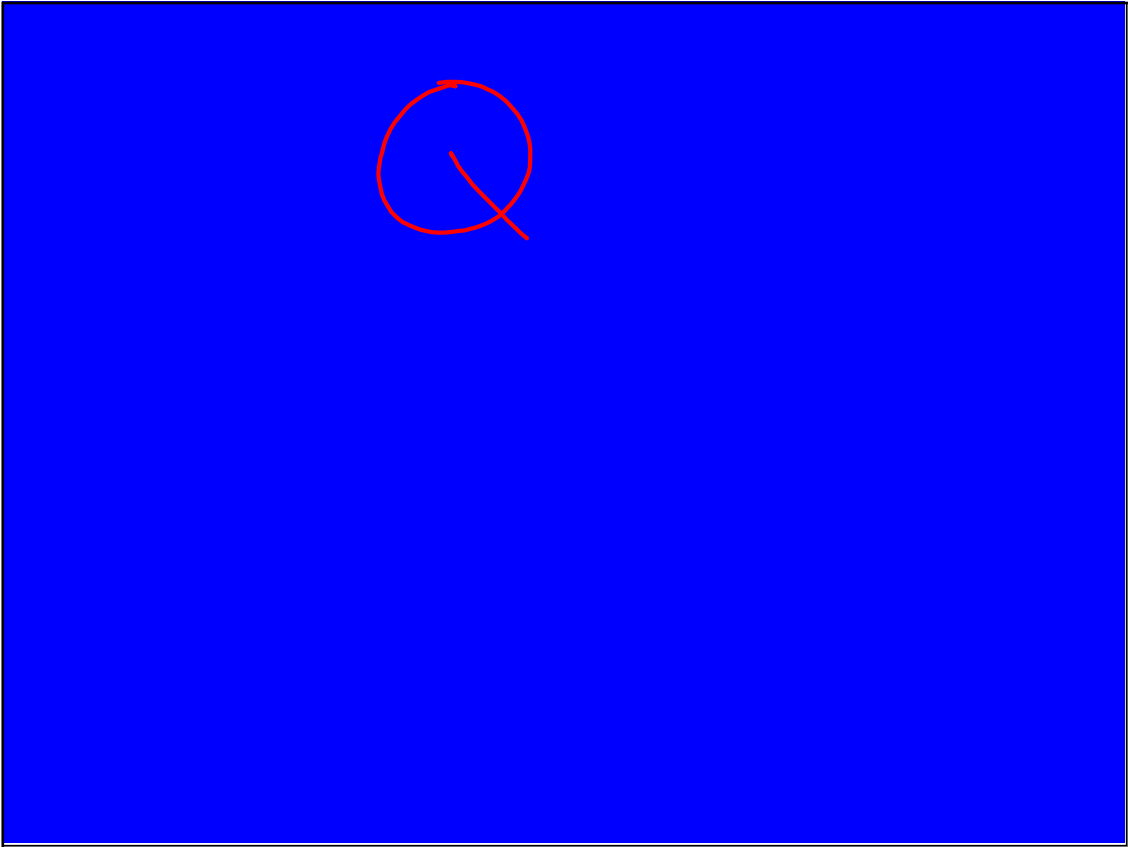
$= \cancel{\frac{1}{2}} \cdot \frac{2}{\sqrt{3}}$

$= \frac{1}{\sqrt{3}}$

Brain Break

d

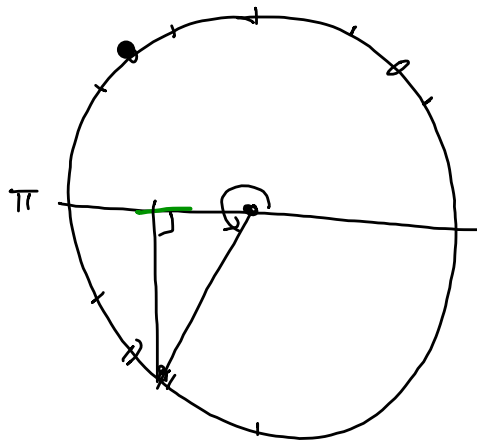
January 31, 2018



90(a) $\sin(4)$

radian
mode

(b) $\sin\left(\frac{4\pi}{3}\right)$

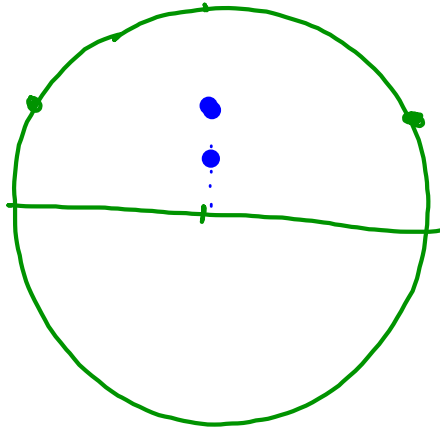


91

$$\sin \theta = 0.5$$

degrees

radians



2

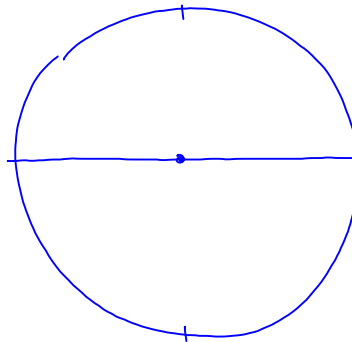
93

6 radians

 $2\pi \approx$

(a) Approx. how many degrees

(b) Estimate
 $\sin(6)$



25

d

January 31, 2018

94

a

$$\log(16)$$

b

$$\log \sqrt{10}$$

c

$$\log(0)$$

95

$$\text{Future Value} = \text{Present Value} (1 + r)^t$$

← # years
annual interest rate

$$20 = 1(1)(1+r)^{15}$$

(compounded annually)

$$2 = (1+r)^{15}$$

2

$$\sqrt[15]{2} = 1+r$$

96

Angle A

$$\sin(A) = \frac{3}{10}$$

$$\tan(A) = \underline{\underline{\frac{3}{10}}}$$

$$\cos^2(A) + \sin^2(A) = 1$$

$$\cos^2(A) + \left(\frac{3}{10}\right)^2 = 1$$

$$\cos^2 A + \frac{9}{100} = \frac{100}{100}$$

2 5

97b

$$f(x) = \log_7(x)$$

$$x = \log_7(y)$$

$$7^x = y$$

$$y = 7^x$$

97b

$$f(x) = \log_7(x)$$

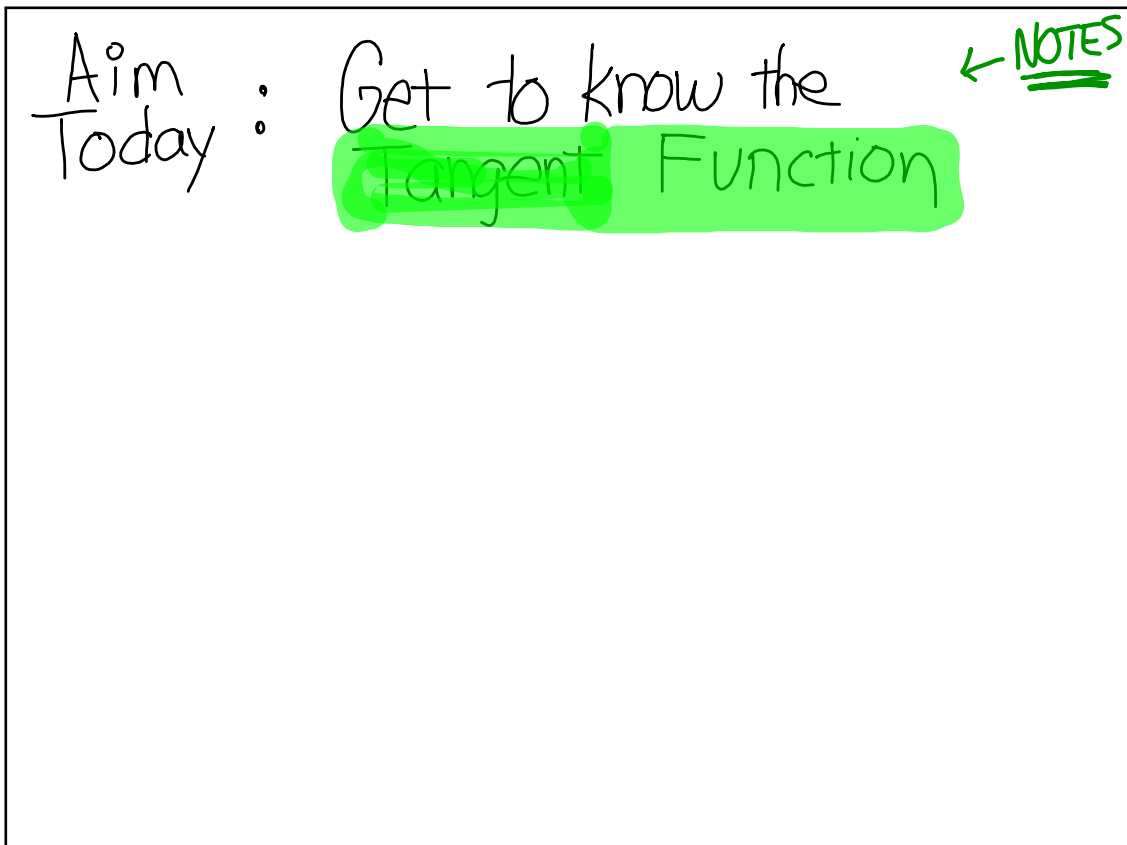
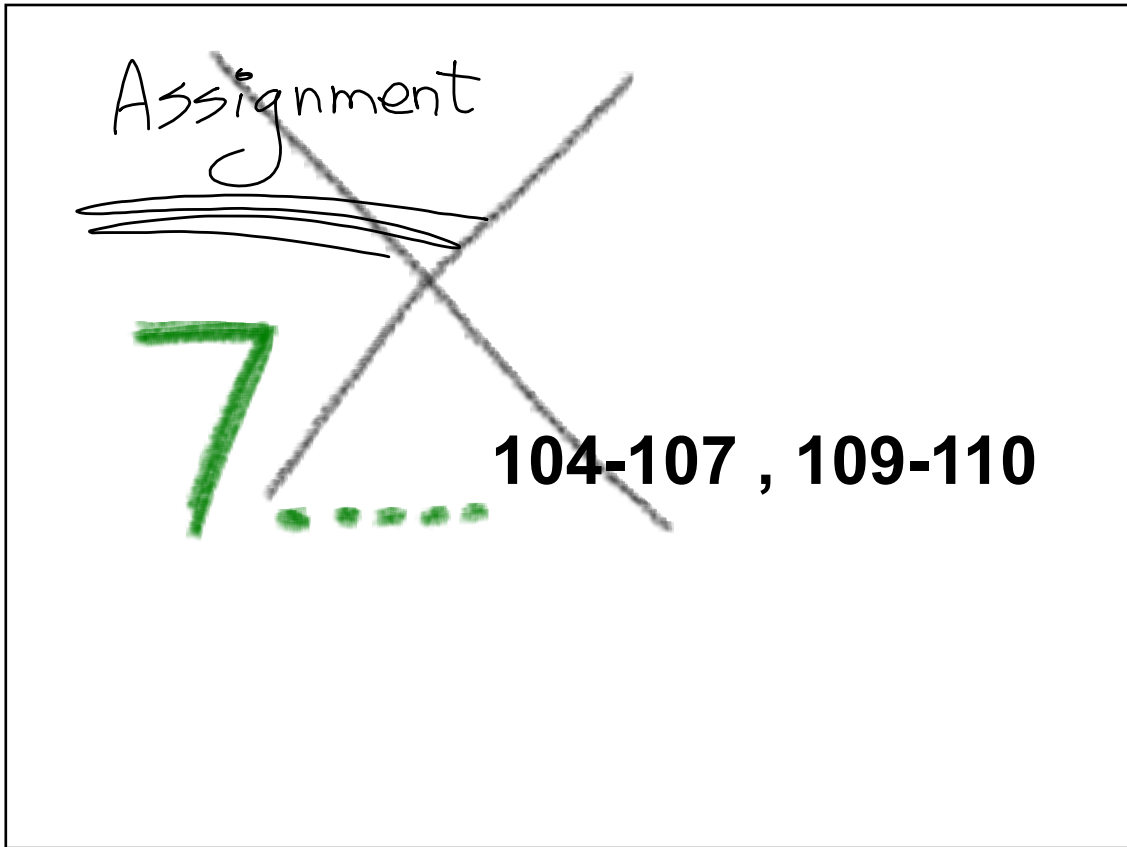
$$x = \log_7(y)$$

$$7^x = y$$

$$y = 7^x$$



**Assignment
Worksheet 7.1.7**

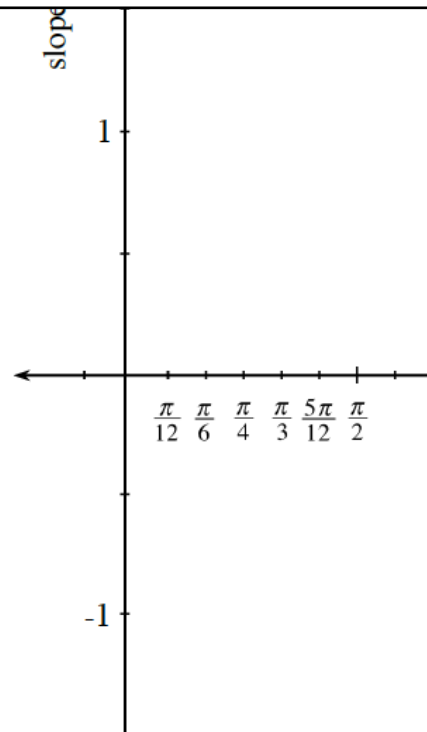
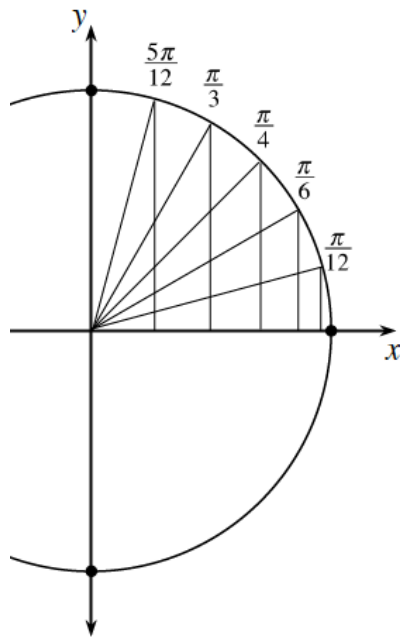


d

January 31, 2018

$$\frac{0}{1} = 0$$

$$\frac{1}{0} =$$

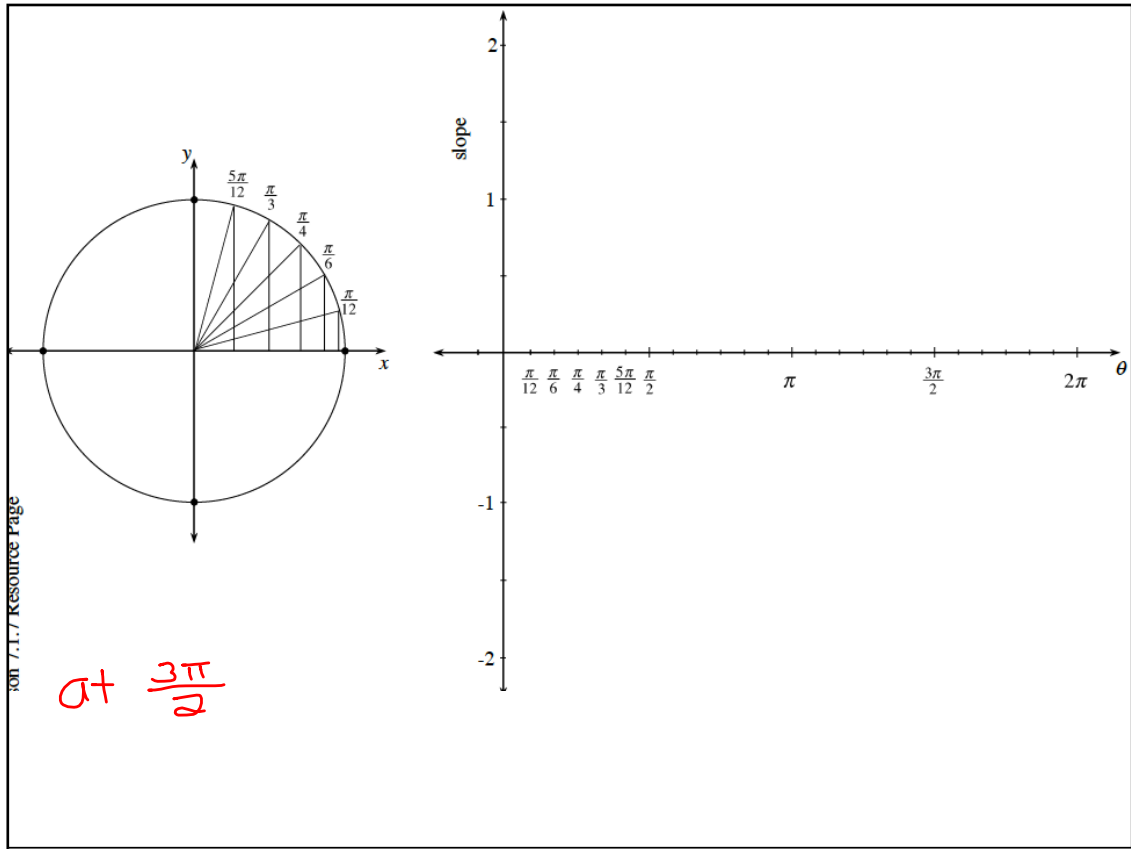


at 0

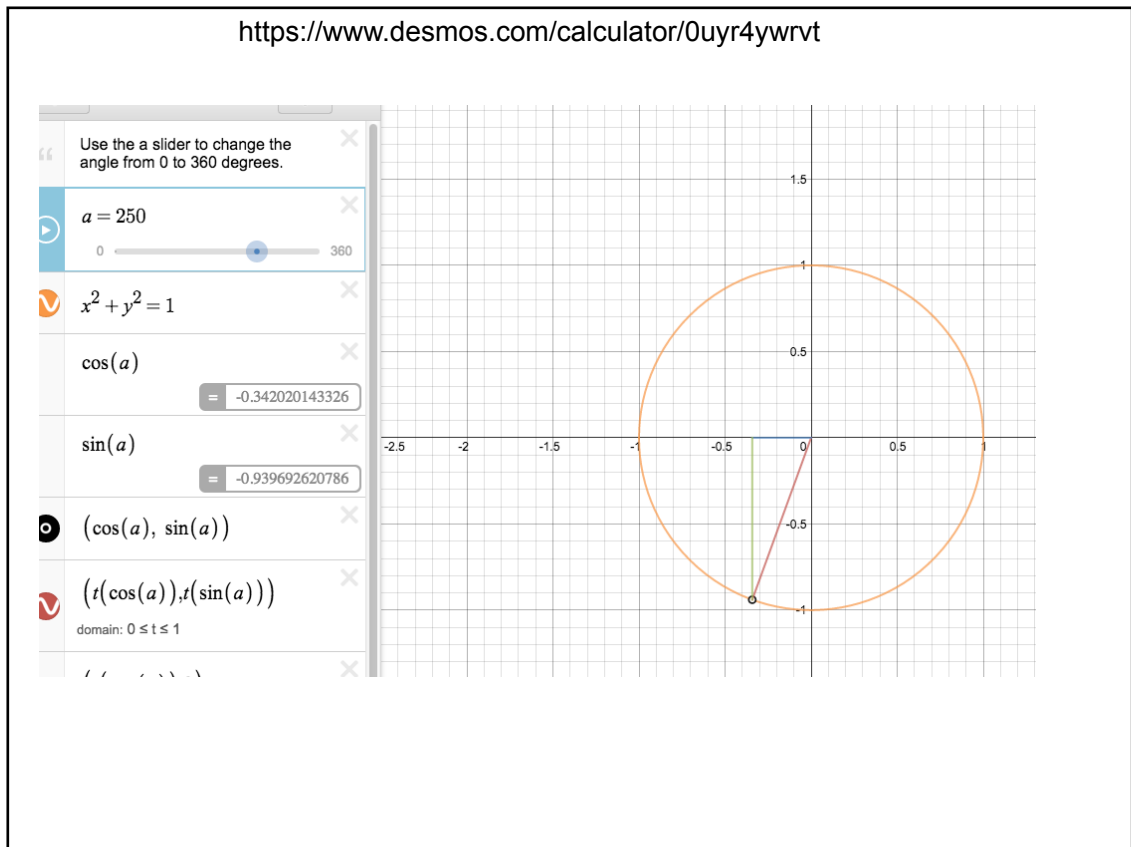
at $\frac{\pi}{2}$

d

January 31, 2018



<https://www.desmos.com/calculator/0uyr4ywrvt>



ON GDC

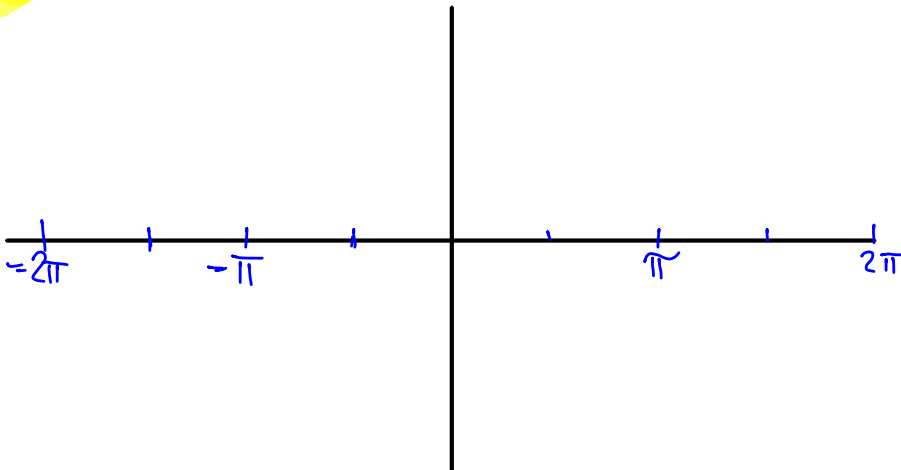
- degrees first $0^\circ < \theta < 360^\circ$
- Zoom TRIG

• ^{now} radians $0 < \theta < 2\pi$

• Zoom TRIG

Notes:

$$f(x) = \tan \theta$$



Domain

Range

θ -intercepts

Symmetry

Period :

Assignment

7.....

104-107 , 109-110