Aim: What is the unit circle?

OCW:
1. Finish worksheet
2.

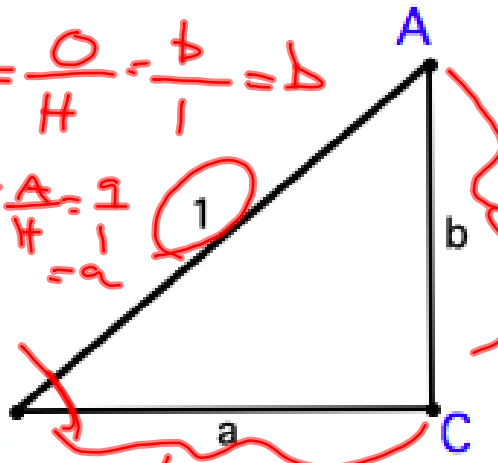
Agenda:
1. Get Ready
2. Mini-lesson
3. Activity
4. Wrap up

Get Ready:
Find:

1) Sin B $= \frac{O}{H} = \frac{b}{1} = b$

2) Cos B $= \frac{A}{H} = \frac{a}{1} = a$

3) Tan B $= \frac{O}{A} = \frac{b}{a}$



SOH
CAH
TOA

height

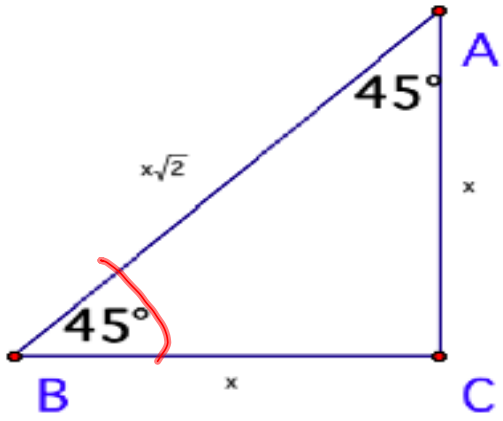
horizontal / length

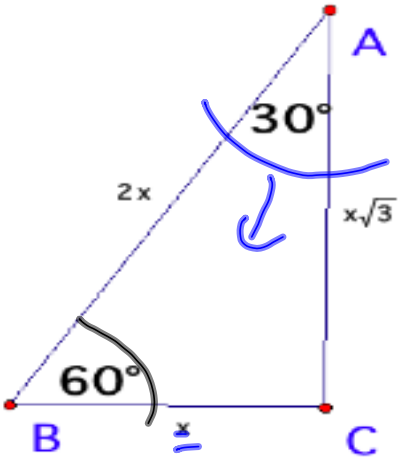
$y = \frac{\sin B}{\cos B} \rightarrow \frac{\text{height}}{\text{length}} = \frac{\Delta y}{\Delta x}$

slope of radius

Aim: What is the unit circle?

Solve for all six trig ratios of 30, 45, 60





$\sin 45° = \frac{x}{x\sqrt{2}} = \frac{1}{\sqrt{2}}$

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

$\csc 45° = \frac{x\sqrt{2}}{x} = \sqrt{2}$

$\tan 45° = \frac{x}{x} = 1$

$\sin 60 = \frac{x\sqrt{3}}{2x} = \frac{\sqrt{3}}{2}$

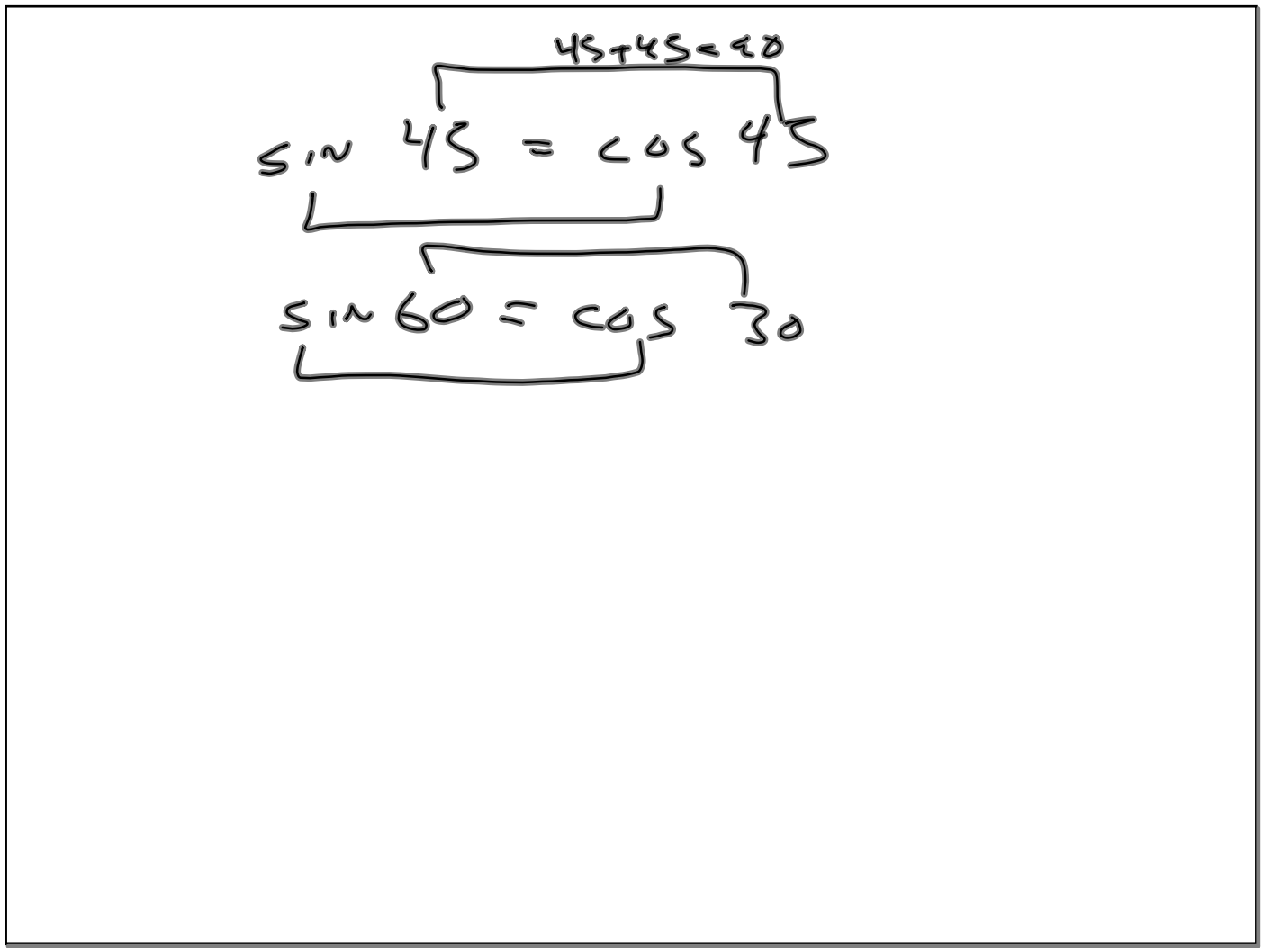
$\cos 60° = \frac{x}{2x} = \frac{1}{2}$

$\tan 60 = \frac{x\sqrt{3}}{x} = \sqrt{3}$

$\sin 30° = \frac{x}{2x} = \frac{1}{2}$

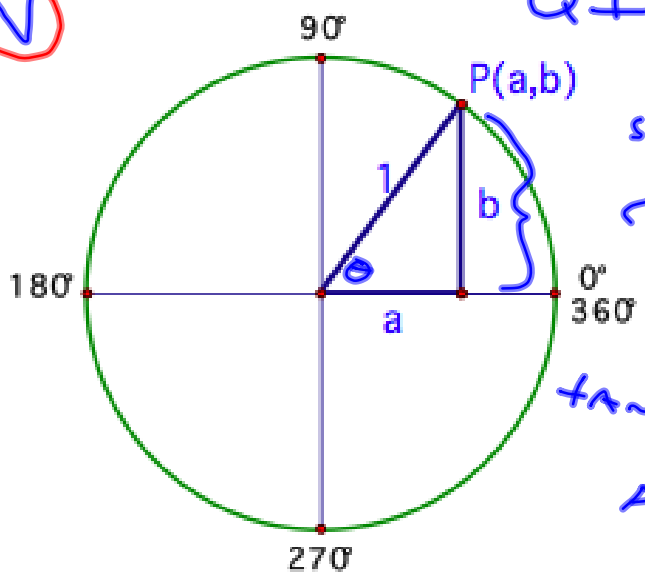
$\cos 30 = \frac{x\sqrt{3}}{2x} = \frac{\sqrt{3}}{2}$

$\tan 30 = \frac{x}{x\sqrt{3}} = \frac{1}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{\sqrt{3}}{3}$


45+45=90
sin 45 = cos 45
sin 60 = cos 30

Aim: What is the unit circle?

I.



QI

$\sin\theta = b$ → height → y-value

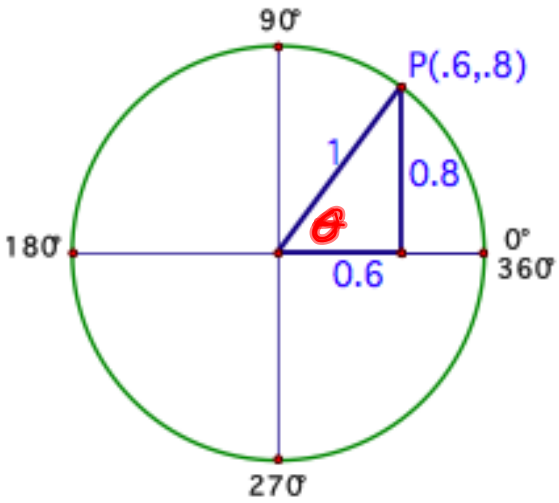
$\cos\theta = a$ → length → x-value

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

positive slope

Aim: What is the unit circle?

II.



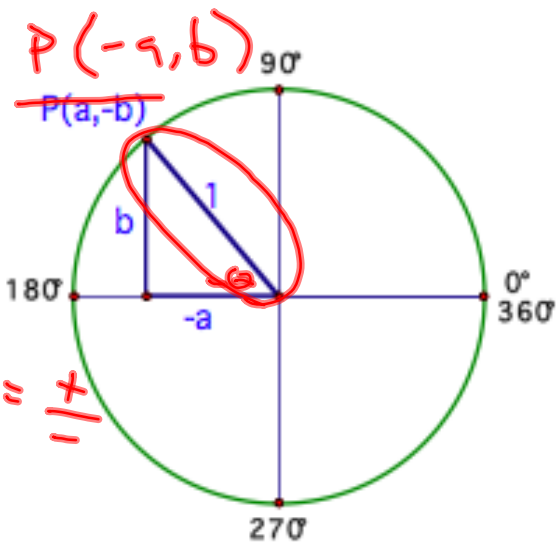
$\sin\theta = .8$

$\cos\theta = .6$

$\tan\theta = \frac{\sin\theta}{\cos\theta} = \frac{.8}{.6} = \frac{4}{3}$

Aim: What is the unit circle?

III.

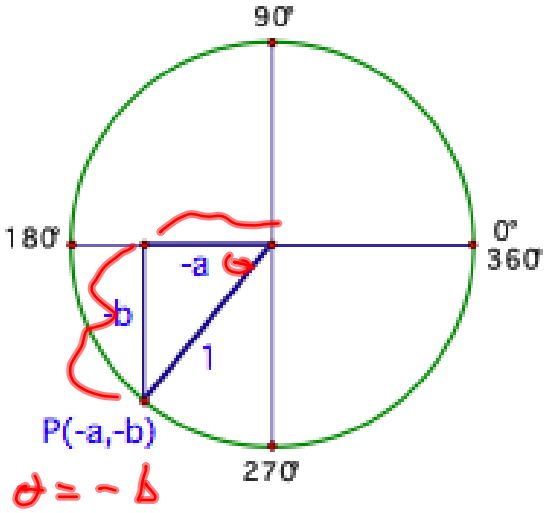


$\sin\theta = b$

$\cos\theta = -a$

$\tan\theta = \frac{\sin\theta}{\cos\theta} = \frac{b}{-a}$

Aim: What is the unit circle?

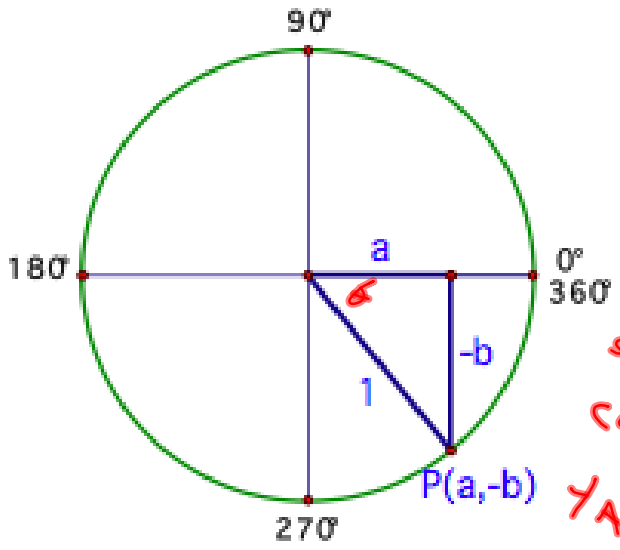


$\sin\theta = -b$

$\cos\theta = -a$

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

Aim: What is the unit circle?



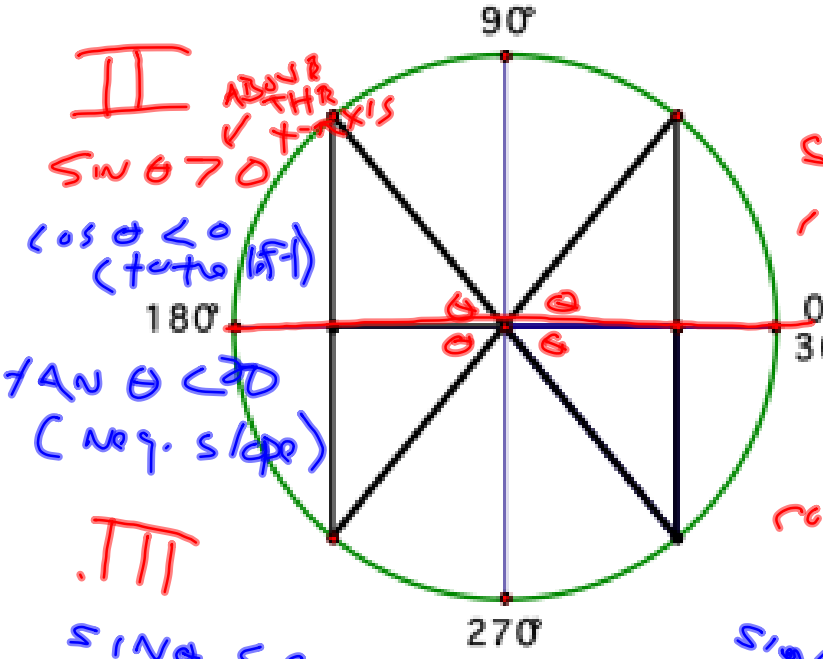
$\sin\theta = -b$

$\cos\theta = a$

$\tan\theta = \frac{\sin\theta}{\cos\theta} = \frac{-b}{a} = -\frac{b}{a}$

negative

Aim: What is the unit circle?



II

ABOVE THE x-AXIS

$\sin\theta > 0$

$\cos\theta < 0$ (to the left)

$\tan\theta < 0$ (neg. slope)

I

$\sin\theta > 0$ (ABOVE THE x-AXIS)

$\cos\theta > 0$ (to the right)

$\tan\theta > 0$ (positive slope)

III

$\sin\theta < 0$ (BELOW x-AXIS)

$\cos\theta < 0$ (to the left)

$\tan\theta > 0$ (pos. slope)

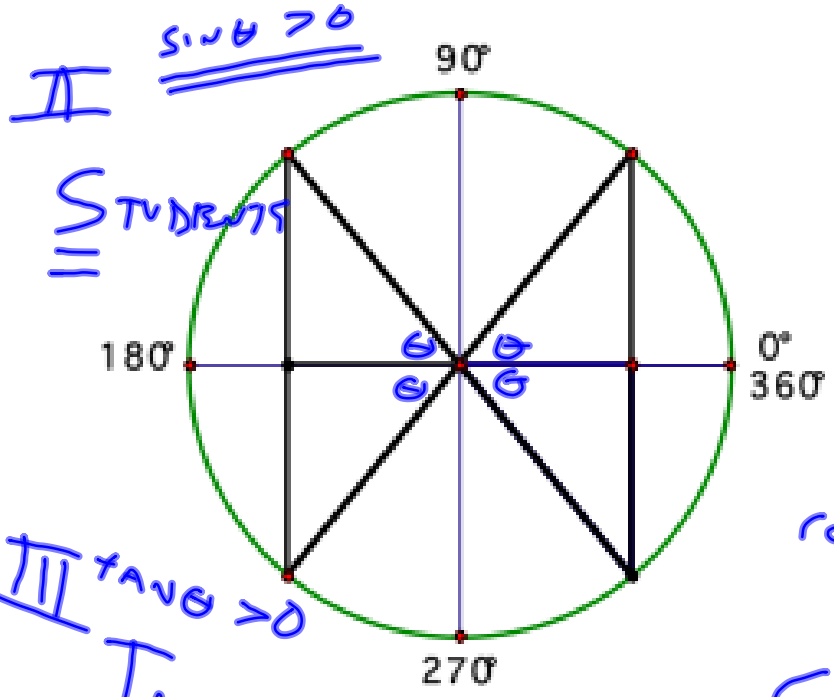
IV

$\sin\theta < 0$ (BELOW x-AXIS)

$\cos\theta > 0$ (to the right)

$\tan\theta < 0$ (neg. slope)

Aim: What is the unit circle?



II sin θ > 0
STUDENTS

I
ALL sine cose tang +

III tan θ > 0
TEA

IV cos θ > 0
CALCULUS

Aim: What is the unit circle?

270

VI. Name the quadrant:

a. sin>0 and cos<0

b. cos>0 and tan>0

c. sin<0 and tan>0

d. tan<0 and cos >0

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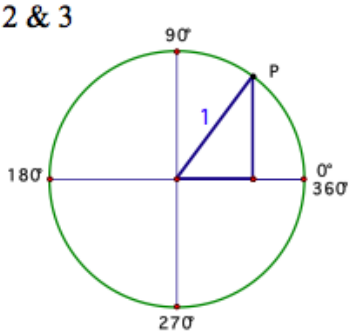
1) Fill in the table with the sign of each function

Quadrant	$\sin\theta$	$\cos\theta$	$\tan\theta$
I			
II			
III			
IV			

Aim: What is the unit circle?

Use sketch for #'s 2 & 3



2) If the coordinate of point P are $(0.5, 0.5\sqrt{3})$,
find: a) $\sin\theta$ b) $\cos\theta$ c) $\tan\theta$

3) If the coordinate of point P are $(\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2})$, find:
a) $\sin\theta$ b) $\cos\theta$ c) $\tan\theta$

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4) If $m\angle A = 250°$:
a) In which quadrant does the terminal side of $\angle A$ terminate?

b) Is Sin A positive or negative? Why?

Aim: What is the unit circle?

For #'s 5-9, identify the quadrant that the angle lies(terminate):

5) $\sin\theta > 0$ and $\cos\theta < 0$

6) $\tan\theta$ is positive and $\cos\ \theta$ is negative

7) $\sin B = -\frac{3}{5}$ and $\cos B > 0$

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8) tan A>0 and (tan A)(sin A)>0

9) $\tan x = -1$ and $\cos x = -\frac{\sqrt{2}}{2}$

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10) If $\sin\theta = -\frac{1}{2}$ and $\cos\theta = -\frac{\sqrt{3}}{2}$, which of the following could be the value of θ?

(a) 30 (b) 150 (c) 210 (d) 330