Calc AB

Lesson 4

8/6/15

Agenda: 8/6/15

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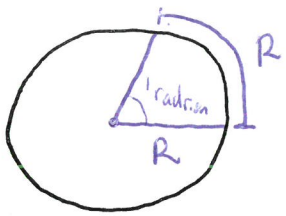
- Lesson 4
  Trigonometry Review
- Work on Problem Set 4, 5
  Assigned problems

- I will record the example numbers from the book I do use and no numbers means not from book.

T/F: Trigonometric functions return an angle when given a value.

Radians

If the arc length of a circle is the same as the radius then the central angle is 1 radian.



Relation: $S = \theta R$

S: arc length; θ: central angle; R: radius

- We know for a full circle there are 2π radians since this is the circum.

Conversion: $\frac{\pi \text{ rad}}{180^\circ}$ and $\frac{180^\circ}{\pi \text{ rad}}$

$\frac{\pi \text{ rad}}{180^\circ}$: degree → rad

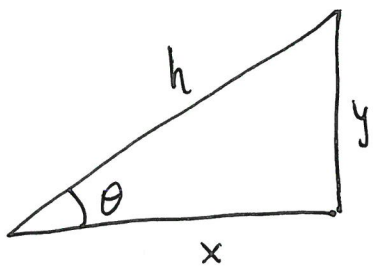
$\frac{180^\circ}{\pi \text{ rad}}$: rad → degree

$\sin\theta = \frac{y}{h}$

$\cos\theta = \frac{x}{h}$

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

SohCahToh



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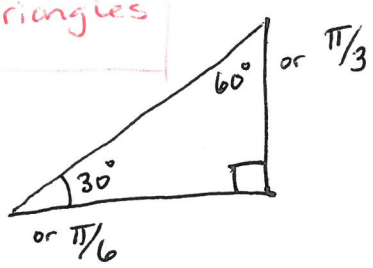
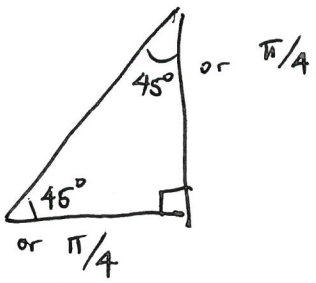
reciprocal functions: • Starting letter gets flipped!

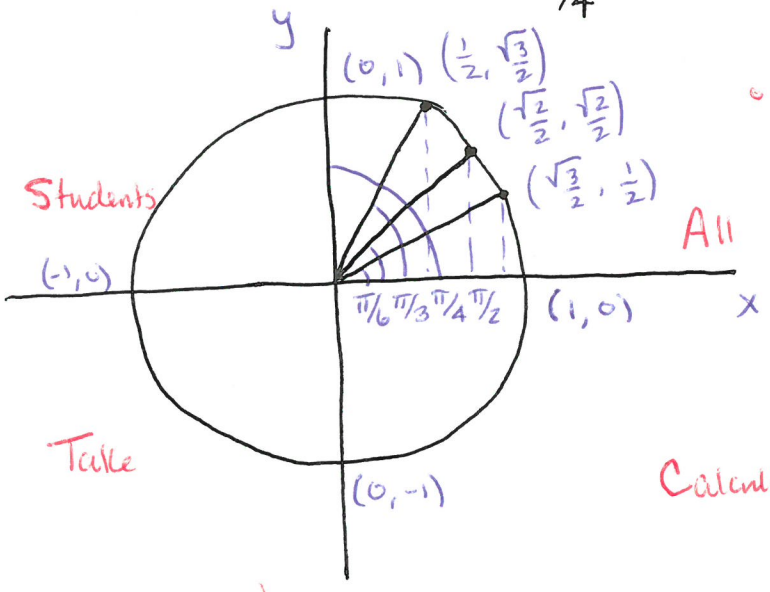
$$\csc\theta = \frac{1}{\sin\theta} \qquad \sec\theta = \frac{1}{\cos\theta} \qquad \cot\theta = \frac{1}{\tan\theta}$$

30-60 45 Triangles





Unit Circle:

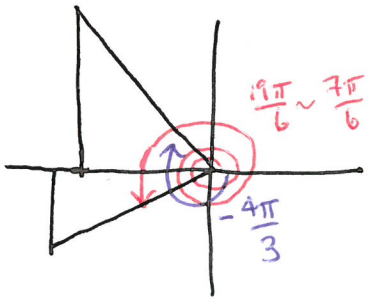


X is negative

y is negative

• What about the other quadrants?

Ex. 4.4 Evaluate: $2\sin\left(\frac{19\pi}{6}\right) + 3\sin\left(-\frac{4\pi}{3}\right)$



$$= 2\left(-\sin\left(\frac{\pi}{6}\right)\right) + 3\sin\left(\frac{\pi}{3}\right)$$

$$= -2\cdot\left(\frac{1}{2}\right) + 3\left(\frac{\sqrt{3}}{2}\right)$$

$$= \boxed{-1 + \frac{3\sqrt{3}}{2}}$$

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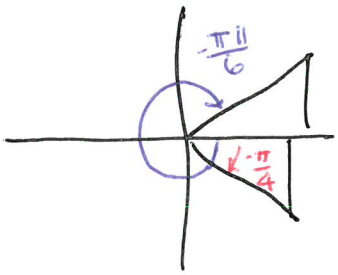
Ex. 4.5 Evaluate $4\tan\left(-\frac{11\pi}{6}\right) + 2\sec\left(-\frac{\pi}{4}\right)$



$$= 4\tan\left(\frac{\pi}{6}\right) + \frac{2}{\cos(-\pi/4)}$$

$$= 4\left(\frac{1}{\sqrt{3}}\right) + \frac{2}{\cos(\pi/4)}$$

$$= \frac{4\sqrt{3}}{3} + \frac{2}{1/\sqrt{2}}$$

$$= \boxed{\frac{4\sqrt{3}}{3} + 2\sqrt{2}}$$

- rationalize denominators
- No stacked fractions

Simplify Trig Expressions

Ex. Prove that $\frac{\cot\theta\cos\theta}{\csc\theta} = \cos^2\theta$ by simplifying the left side.

$$\frac{\cot\theta\cos\theta}{\csc\theta} = \frac{\left(\frac{\cos\theta}{\sin\theta}\right)\cos\theta}{\frac{1}{\sin\theta}} = \cos^2\theta$$