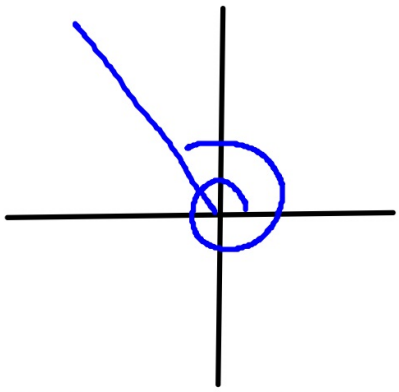
September 13

SWBAT:

Find the values of all six trig functions for any right triangle

$\cos\left(\frac{8\pi}{3}\right) = \cos\left(\frac{2\pi}{3}\right) = -\frac{1}{2}$

$\frac{8\pi}{3} = 2\pi + \frac{2\pi}{3}$



$\frac{8}{3} = 2.667 = 2\frac{2}{3}$

$\frac{8\pi}{3} - 2\pi = \frac{8\pi}{3} - \frac{6\pi}{3} = \frac{2\pi}{3}$

*add or subtract 2π until you find an angle on the unit circle

$$\sin\left(-\frac{19\pi}{6}\right)$$

$$-\frac{19\pi}{6}+2\pi=-\frac{19\pi}{6}+\frac{12\pi}{6}$$

$$=\frac{-7\pi}{6}$$

$$\sin\left(\frac{-19\pi}{6}\right)=\sin\left(\frac{-7\pi}{6}\right)=\frac{1}{2}$$

$$\sec\left(\frac{19\pi}{3}\right)$$

$$\frac{19\pi}{3}-2\pi=\frac{19\pi}{3}-\frac{6\pi}{3}=\frac{13\pi}{3}$$

$$\frac{13\pi}{3}-2\pi=\frac{13\pi}{3}-\frac{6\pi}{3}=\frac{7\pi}{3}$$

$$\frac{7\pi}{3}-2\pi=\frac{7\pi}{3}-\frac{6\pi}{3}=\frac{\pi}{3}$$

$$\sec\left(\frac{19\pi}{3}\right)=\sec\left(\frac{\pi}{3}\right)=2$$

$\sin\left(\frac{11\pi}{3}\right)$

$\frac{11\pi}{3} - \frac{2\pi}{1} = \frac{11\pi}{3} - \frac{6\pi}{3} = \frac{5\pi}{3}$

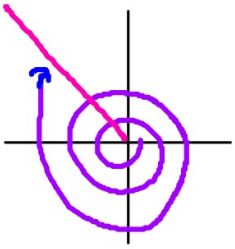
$\sin\left(\frac{11\pi}{3}\right) = \sin\left(\frac{5\pi}{3}\right) = \frac{-\sqrt{3}}{2}$

$\sec\left(\frac{-21\pi}{4}\right)$

$-\frac{21\pi}{4} + \frac{2\pi}{1} = -\frac{21\pi}{4} + \frac{8\pi}{4} = -\frac{13\pi}{4}$

$-\frac{13\pi}{4} + 2\pi = -\frac{13\pi}{4} + \frac{8\pi}{4} = -\frac{5\pi}{4}$

$-\frac{21\pi}{4} + 4\pi = -\frac{21\pi}{4} + \frac{16\pi}{4} = -\frac{5\pi}{4}$



$\sec\left(\frac{-21\pi}{4}\right) = \sec\left(\frac{-5\pi}{4}\right) = \frac{-2}{\sqrt{2}}$

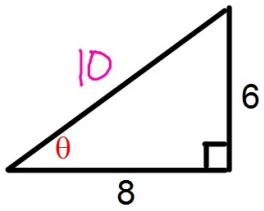
$\sin(\theta) = \frac{\text{opposite}}{\text{hypotenuse}}$ $\csc(\theta) = \frac{\text{hypotenuse}}{\text{opposite}}$

$\tan(\theta) = \frac{\text{opposite}}{\text{adjacent}}$ $\cot(\theta) = \frac{\text{adjacent}}{\text{opposite}}$

$\sec(\theta) = \frac{\text{hypotenuse}}{\text{adjacent}}$ $\cos(\theta) = \frac{\text{adjacent}}{\text{hypotenuse}}$

hypotenuse adjacent opposite

Find the exact value of the six trigonometric functions



$\sin(\theta) = \frac{\text{opposite}}{\text{hypotenuse}}$ $\csc(\theta) = \frac{\text{hypotenuse}}{\text{opposite}}$

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Find missing side

$a^2 + b^2 = c^2$

$6^2 + 8^2 = c^2$

$36 + 64 = c^2$

$100 = c^2$

$10 = c$

$\sin(\theta) = \frac{6}{10}$

$\cos(\theta) = \frac{8}{10}$

$\tan(\theta) = \frac{6}{8}$

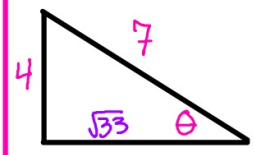
$\csc(\theta) = \frac{10}{6}$

$\sec(\theta) = \frac{10}{8}$

$\cot(\theta) = \frac{8}{6}$

sketch a triangle and find the values of the remaining five trig functions

$$\sin\theta = \frac{4}{7}$$



$\sin\theta = \frac{OPP}{hyp} = \frac{4}{7}$

$4^2 + b^2 = 7^2$

$16 + b^2 = 49$

$-16 \quad -16$

$b^2 = 33$

$b = \sqrt{33}$

$\sin(\theta) = \frac{\text{opposite}}{\text{hypotenuse}}$	$\csc(\theta) = \frac{\text{hypotenuse}}{\text{opposite}}$
$\tan(\theta) = \frac{\text{opposite}}{\text{adjacent}}$	$\cot(\theta) = \frac{\text{adjacent}}{\text{opposite}}$
$\sec(\theta) = \frac{\text{hypotenuse}}{\text{adjacent}}$	$\cos(\theta) = \frac{\text{adjacent}}{\text{hypotenuse}}$

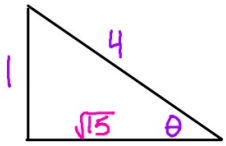
$\sin\theta = \frac{4}{7}$ $\quad \csc\theta = \frac{7}{4}$

$\cos\theta = \frac{\sqrt{33}}{7}$ $\quad \sec\theta = \frac{7}{\sqrt{33}}$

$\tan\theta = \frac{4}{\sqrt{33}}$ $\quad \cot\theta = \frac{\sqrt{33}}{4}$

$\csc\theta = 4$

find the remaining 5 trig functions



$\csc\theta = \frac{4}{1} = \frac{hyp}{opp}$

$1^2 + b^2 = 4^2$

$1 + b^2 = 16$

$b^2 = 15$

$b = \sqrt{15}$

$\sin(\theta) = \frac{\text{opposite}}{\text{hypotenuse}}$	$\csc(\theta) = \frac{\text{hypotenuse}}{\text{opposite}}$
$\tan(\theta) = \frac{\text{opposite}}{\text{adjacent}}$	$\cot(\theta) = \frac{\text{adjacent}}{\text{opposite}}$
$\sec(\theta) = \frac{\text{hypotenuse}}{\text{adjacent}}$	$\cos(\theta) = \frac{\text{adjacent}}{\text{hypotenuse}}$

$\sin\theta = \frac{1}{4}$ $\quad \csc\theta = 4$

$\tan\theta = \frac{1}{\sqrt{15}}$ $\quad \cot\theta = \frac{\sqrt{15}}{1}$

$\cos\theta = \frac{\sqrt{15}}{4}$ $\quad \sec\theta = \frac{4}{\sqrt{15}}$

Factor into the product of two binomials $x^2 + 7x + 6$

Find two numbers that multiply to "c" and add to "b"

$6 \times 1 = 6$

$6 + 1 = 7$

Use these numbers to split the middle term

$x^2 + 6x + 1x + 6$

Consider two terms at a time - and factor

$x(x+6) + 1(x+6)$

$(x+6)(x+1)$

$7x^3 + 14x^2$

$7x^2(x+2)$