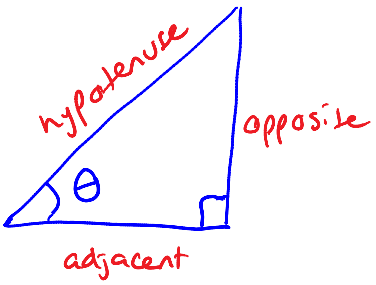
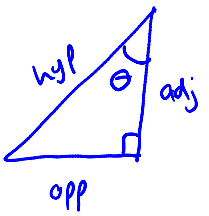
Section 4.1 : cont'd

Wednesday, November 05, 2014
8:41 AM

trigonometric ratios



note:

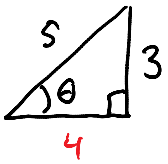


θ - Greek letter "theta"

trig ratios: they are just ratios of these sides

sine	$\sin\theta = \frac{opp}{hyp}$	SOHCAHTOA
cosine	$\cos\theta = \frac{adj}{hyp}$	
tangent	$\tan\theta = \frac{opp}{adj}$	

example: write the three basic trig functions of θ for the following triangle:



$\sin\theta = \frac{opp}{hyp} = \frac{3}{5}$

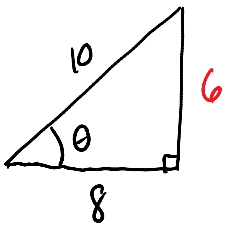
$\cos\theta = \frac{adj}{hyp} = \frac{4}{5}$

4

$\cos\theta = \frac{adj}{hyp} = \frac{4}{5}$

$\tan\theta = \frac{opp}{adj} = \frac{3}{4}$

how about:



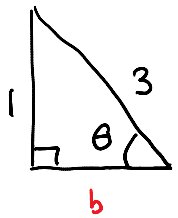
$\sin\theta = \frac{opp}{hyp} = \frac{6}{10} = \frac{3}{5}$

$\cos\theta = \frac{8}{10} = \frac{4}{5}$

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

note: each trig ratio is only a <u>function</u> of the angle - scaling the triangle doesn't change the ratio

example: calculate the <u>exact</u> values of the three basic trig functions of θ for the following triangle



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

$b^2 = c^2 - a^2$

$= 9 - 1$

$= 8$

$b = \sqrt{8} = 2\sqrt{2}$

$\sin\theta = \frac{opp}{hyp} = \frac{1}{3}$

$\cos\theta = \frac{adj}{hyp} = \frac{2\sqrt{2}}{3}$

$\tan\theta = \frac{opp}{adj} = \frac{1}{2\sqrt{2}} \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{2}}{2 \cdot 2} = \frac{\sqrt{2}}{4}$