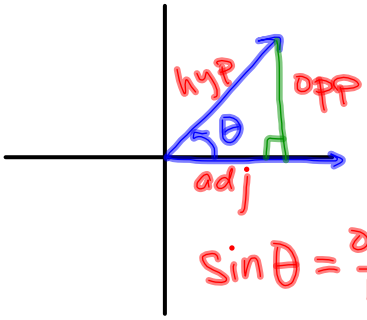
4.2 Trig Fncs of Acute Angles

$< 90°$

Obj: 1. Define the 6 trig fncs using right $\triangle$s.



Standard position:
initial side is on pos. x-axis

$\sin\theta = \frac{opp}{hyp}$ $\quad \csc\theta = \frac{hyp}{opp}$

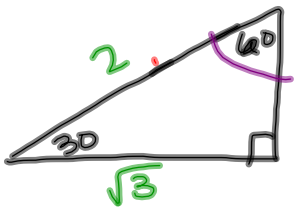
$\cos\theta = \frac{adj}{hyp}$ $\quad \sec\theta = \frac{hyp}{adj}$

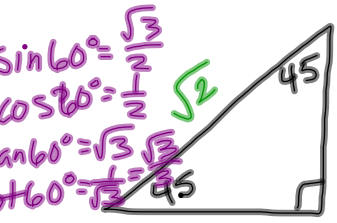
$\tan\theta = \frac{opp}{adj}$ $\quad \cot\theta = \frac{adj}{opp}$

"Soh Cah Toa"

Dec 18-11:25 AM

Special $\triangle$s





$\sin 60° = \frac{\sqrt{3}}{2}$
$\cos 60° = \frac{1}{2}$
$\tan 60° = \sqrt{3}$
$\cot 60° = \frac{1}{\sqrt{3}}$
$\sec 60° = 2$
$\csc 60° = \frac{2\sqrt{3}}{3}$

$\sin 30° = \frac{1}{2}$

$\cos 30° = \frac{\sqrt{3}}{2}$

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

$\csc 30° = 2$

$\sec 30° = \frac{2}{\sqrt{3}} = \frac{2\sqrt{3}}{3}$

$\cot 30° = \sqrt{3}$

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

$\cos 45° = \frac{\sqrt{2}}{2}$

$\tan 45° = 1$

$\csc 45° = \sqrt{2}$

$\sec 45° = \sqrt{2}$

$\cot 45° = 1$

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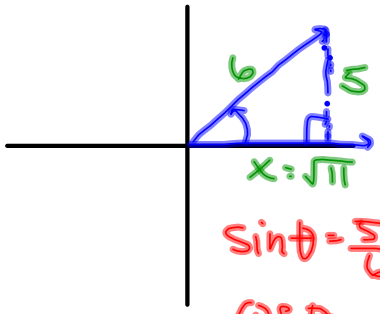
If θ is an acute $\angle$ and $\sin\theta = \frac{5}{6}$, $\frac{opp}{hyp}$

Find all 6 trig fncs.

put θ in standard position



$5^2 + x^2 = 6^2$

$x = \sqrt{11}$

$\sin\theta = \frac{5}{6}$ $\quad \csc\theta = \frac{6}{5}$

$\cos\theta = \frac{\sqrt{11}}{6}$ $\quad \sec\theta = \frac{6\sqrt{11}}{11}$

$\tan\theta = \frac{5}{\sqrt{11}} = \frac{5\sqrt{11}}{11}$ $\quad \cot\theta = \frac{\sqrt{11}}{5}$

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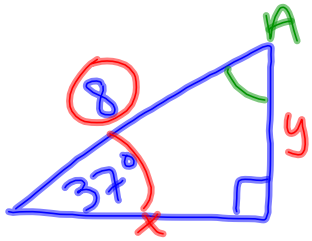
A Right Δ has a hyp = 8 and a 37° angle.

Find the other $\angle$ and side lengths.



$A = 180° - 37° - 90° = 53°$

$\cos 37° = \frac{x}{8}$

$x = 8\cos 37° \approx 6.39$

$8\sin 37° = \frac{y}{8} \cdot 8$

$y = 8\sin 37° \approx 4.81$

Dec 19-9:45 AM