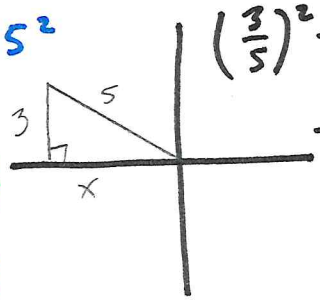
Honors Algebra 2
Pythagorean Identity Practice

Name Key Hr_

Given one trig ratio, find the other **2** ratios. Then verify the identity. Show the triangle for each example.

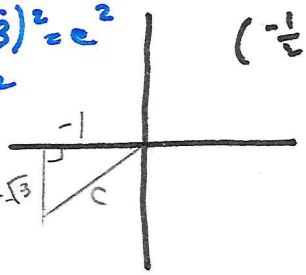
1. Given $\sin\theta = \frac{3}{5}$ and $\cos\theta$ is negative.



$3^2+x^2=5^2$
$x=4$
$\cos=-4/5$
$\tan=-\frac{3}{4}$

$\left(\frac{3}{5}\right)^2+\left(\frac{-4}{5}\right)^2=1$
$\frac{9}{25}+\frac{16}{25}=1$
$\frac{25}{25}=1$ ✓

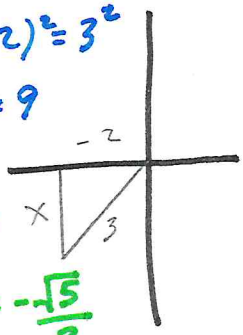
2. Given $\tan\theta = \frac{\sqrt{3}}{1}$ and $\sin\theta$ is negative.



$(-1)^2+(-\sqrt{3})^2=c^2$
$1+3=c^2$
$2=c$
$\cos=-1/2$
$\sin=-\frac{\sqrt{3}}{2}$

$\left(\frac{-1}{2}\right)^2+\left(\frac{-\sqrt{3}}{2}\right)^2=1$
$\frac{1}{4}+\frac{3}{4}=1$
$\frac{4}{4}=1$ ✓

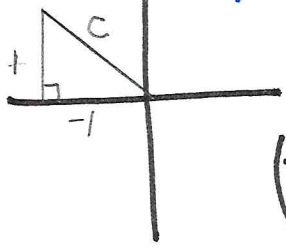
3. Given $\cos\theta = -\frac{2}{3}$ and $\tan\theta$ is positive.



$x^2+(-2)^2=3^2$
$x^2+4=9$
$x^2=5$
$x=-\sqrt{5}$
$\sin=-\frac{\sqrt{5}}{3}$
$\tan=\frac{\sqrt{5}}{2}$

$\left(\frac{-\sqrt{5}}{3}\right)^2+\left(\frac{-2}{3}\right)^2=1$
$\frac{5}{9}+\frac{4}{9}=1$
$\frac{9}{9}=1$ ✓

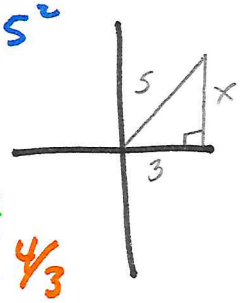
4. Given $\tan\theta = \frac{-1}{1}$ and $\sin\theta$ is positive.



$1^2+(-1)^2=c^2$
$1+1=c^2$
$2=c^2$
$c=\sqrt{2}$
$\cos=\frac{-1}{\sqrt{2}}=\frac{-\sqrt{2}}{2}$
$\sin=\frac{\sqrt{2}}{2}$

$\left(\frac{\sqrt{2}}{2}\right)^2+\left(\frac{-\sqrt{2}}{2}\right)^2=1$
$\frac{2}{4}+\frac{2}{4}=1$
$4/4=1$ ✓

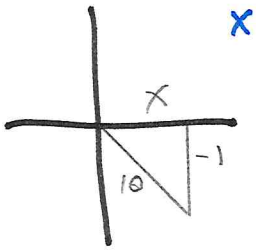
5. Given $\cos\theta = \frac{3}{5}$ and $\sin\theta$ is positive.



$x^2+3^2=5^2$
$x=4$
$\sin=\frac{4}{5}$
$\tan=4/3$

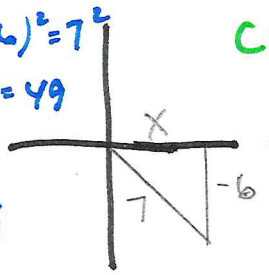
$\left(\frac{4}{5}\right)^2+\left(\frac{3}{5}\right)^2=1$
$\frac{16}{25}+\frac{9}{25}=1$
$\frac{25}{25}=1$ ✓

6. Given $\sin\theta = -\frac{1}{10}$ and $\cos\theta$ is positive.



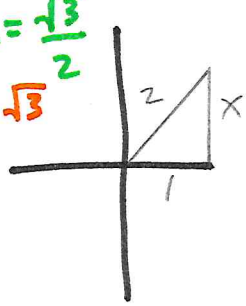
$x^2+(-1)^2=10^2$
$x^2+1=100$
$x^2=99$
$x=3\sqrt{11}$
$\cos=\frac{3\sqrt{11}}{10}$
$\tan=\frac{-1}{3\sqrt{11}}$
$=\frac{-10\sqrt{11}}{33}$

7. Given $\sin\theta = -\frac{6}{7}$ and $\tan\theta$ is negative.



$x^2+(-6)^2=7^2$
$x^2+36=49$
$x^2=13$
$x=\sqrt{13}$
$\cos=\frac{\sqrt{13}}{7}$
$\tan=\frac{-6}{\sqrt{13}/7}$
$=\frac{-42\sqrt{13}}{13}$

8. Given $\cos\theta = \frac{1}{2}$ and $\tan\theta$ is positive.



$\sin=\frac{\sqrt{3}}{2}$
$\tan=\sqrt{3}$
$x^2+1^2=2^2$
$x^2+1=4$
$x^2=3$
$x=\sqrt{3}$