Secondary II-Unit 1.3 Trigonometry Notes Name_____

Day 1: Sine, Cosine, and Tangent

Date_____ Period____

Right Triangle Trigonometry

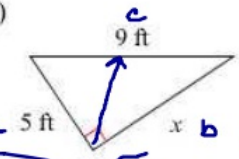
1) To find a missing side of a right triangle use the Pythagorean Thm.

This Theorem is $a^2+b^2=c^2$.

a and b are the legs and c is the hypotenuse.

Find the missing side of each triangle.

2)



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

$5^2+x^2=9^2$

$25+x^2=81$

$-25 \quad -25$

$\sqrt{x^2}=\sqrt{56}$

$x=7.48\ldots$

4

$x=2\sqrt{14}$

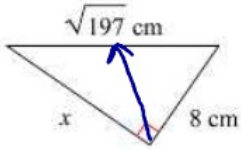
$\sqrt{56}$

$2\sqrt{28}$

$2\sqrt{2}\sqrt{14}$

$2\sqrt{7}$

3)



$x^2+8^2=(\sqrt{197})^2$

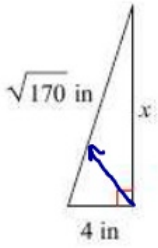
$x^2+64=197$

$-64 \quad -64$

$\sqrt{x^2}=\sqrt{133}$

$x=\sqrt{133}$

4)



$x^2+4^2=(\sqrt{170})^2$

$x^2+16=170$

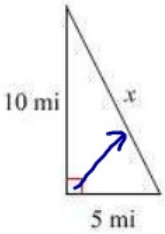
$\sqrt{x^2}=\sqrt{154}$

$2\ 77$

$7\ 11$

$x=\sqrt{154}$

5)



$10^2+5^2=x^2$

$100+25=x^2$

$\sqrt{125}=\sqrt{x^2}$

$5\ 25$

$5\ 5$

$5\sqrt{5}=x$

Trigonometry Ratios

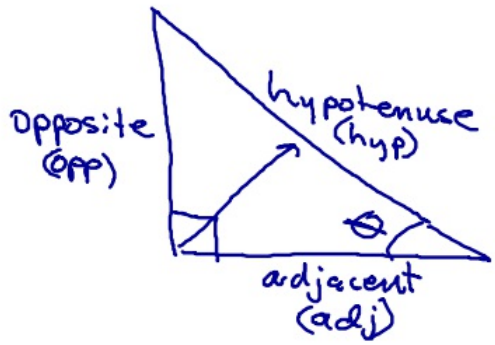
6) Trig Ratios can be used to find missing sides and missing angles of right triangles.

The following are trig ratios (you need to memorize these): Soh-Cah-Toa

Sine which has the ratio of sin θ = $\frac{opp}{hyp}$

Cosine which has the raito of cos θ = $\frac{adj}{hyp}$

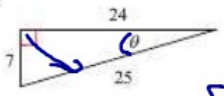
Tangent which has the ratio of tan θ = $\frac{opp}{adj}$



Soh-Cah-Toa.

Find the value of the trig function indicated.

7) $\cos\theta$



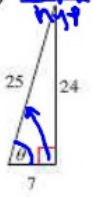
$\cos\theta = \frac{adj}{hyp}$

$\cos\theta = \frac{24}{25}$

$\frac{24}{25}$

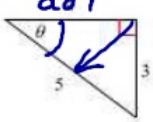
$\cos^{-1}\frac{24}{25} = \theta$

8) $\sin\theta$ $\frac{opp}{hyp}$



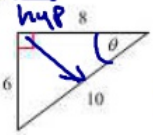
$\sin\theta = \frac{24}{25}$

9) $\tan\theta$ $\frac{opp}{adj}$



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

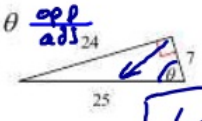
10) $\cos\theta$ $\frac{adj}{hyp}$



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

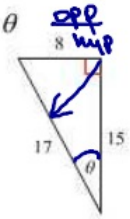
$\cos\theta = \frac{4}{5}$

11) $\tan\theta$ $\frac{opp}{adj}$



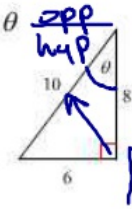
$\tan\theta = \frac{24}{7}$

12) $\sin\theta$ $\frac{opp}{hyp}$



$\sin\theta = \frac{8}{17}$

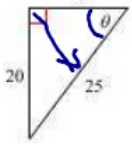
13) $\sin\theta$ $\frac{opp}{hyp}$



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

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

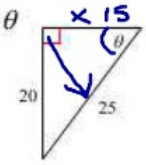
14) $\cos\theta$



$\cos\theta = \frac{15}{25}$

$\cos\theta = \frac{3}{5}$

15) $\cos\theta$



$x^2 + 20^2 = 25^2$

$x^2 + 400 = 625$

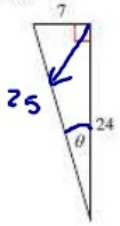
$\sqrt{x^2} = \sqrt{225}$

$x = 15$

$\cos\theta = \frac{15}{25}$

$\cos\theta = \frac{3}{5}$

16) $\sin\theta$



$7^2 + 24^2 = x^2$

$49 + 576 = x^2$

$625 = x^2$

$25 = x$

$\sin\theta = \frac{7}{25}$

17) Given any trig value we can construct the triangle and find all other trig values.

If $\sin\theta = \frac{4}{5}$ what is $\tan\theta$? $\sin\theta = \frac{opp}{hyp}$

First construct your right triangle and label sides given.

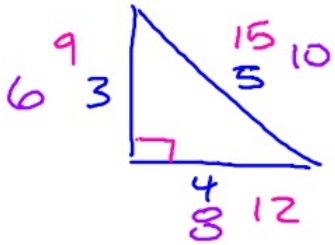
Next, use pythagorean theorem to solve for the missing side.

$x^2 + 4^2 = 5^2$

$x^2 + 16 = 25$

$x^2 = 9$

$x = 3$



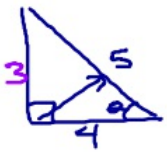
Evalute trig functions using the constructed triangle.

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

$\cos\theta =$ $\frac{3}{5}$

Find the value of the two remaining trig functions.

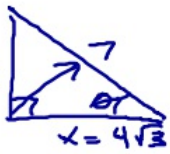
18) If $\cos\theta = \frac{4}{5}$ then $\frac{adj}{hyp}$



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

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

19) If $\sin\theta = \frac{1}{7}$ then $\frac{opp}{hyp}$



$\cos\theta =$ $\frac{4\sqrt{3}}{7}$

$\tan\theta =$ $\frac{1}{4\sqrt{3}} = \frac{\sqrt{3}}{12}$

$1^2 + x^2 = 7^2$

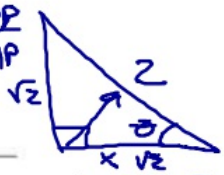
$1 + x^2 = 49$

$x^2 = 48$

2 | 24
3 | 12
2 | 6
3

$x = 4\sqrt{3}$

20) If $\sin\theta = \frac{\sqrt{2}}{2}$ then $\frac{opp}{hyp}$



$\cos\theta =$ $\frac{\sqrt{2}}{2}$

$\tan\theta =$ $\frac{\sqrt{2}}{\sqrt{2}} = 1$

$(\sqrt{2})^2 + x^2 = 2^2$

$2 + x^2 = 4$

$x^2 = 2$

$x = \sqrt{2}$

21) If $\sin\theta = \frac{15}{17}$ then $\frac{opp}{hyp}$

$\cos\theta =$ $\frac{8}{17}$

$\tan\theta =$ $\frac{15}{8}$

$15^2 + x^2 = 17^2$

$225 + x^2 = 289$

$x^2 = 64$

$x = 8$