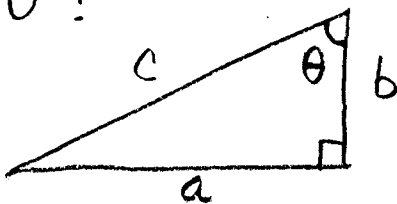
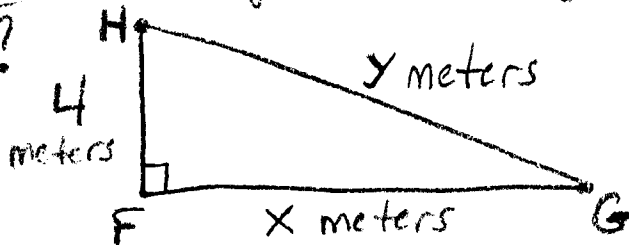


ACT ① The dimensions of the right triangle shown below are given in feet. What is $\sin \theta$?



- Ⓐ $\frac{a}{b}$ Ⓑ $\frac{a}{c}$ Ⓒ $\frac{b}{c}$ Ⓓ $\frac{b}{a}$ Ⓔ $\frac{c}{a}$

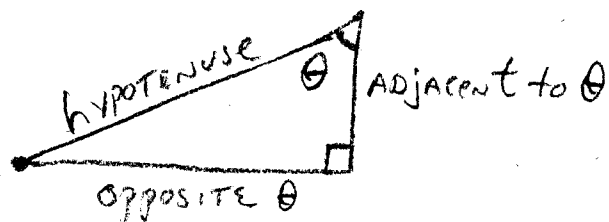
② For $\triangle FGH$ shown below, which of the following is an expression for y in terms of x ?



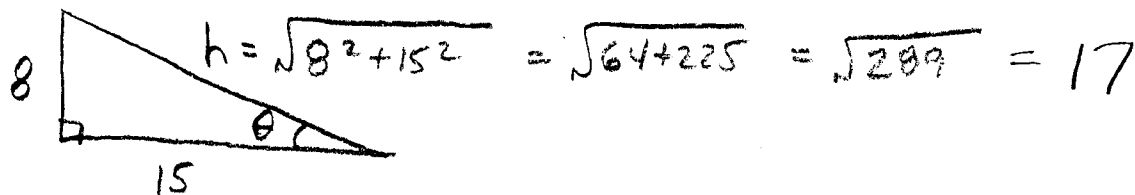
- Ⓐ $x+4$ Ⓑ $\sqrt{x^2+4}$ Ⓒ $\sqrt{x^2+8}$
Ⓓ $\sqrt{x^2-16}$ Ⓔ $\sqrt{x^2+16}$

Homework Review: Pg. 706 # 2, 4-6, 15.

②



④



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

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

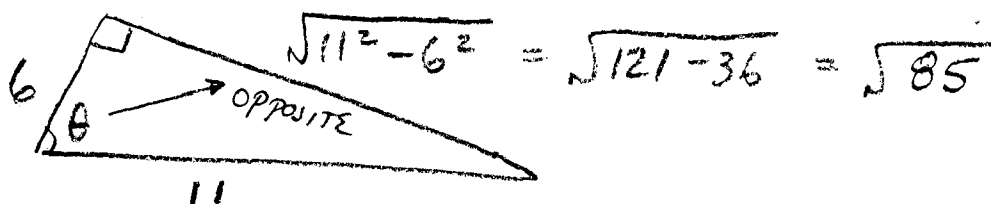
$$\cos \theta = \frac{15}{17}$$

$$\sec \theta = \frac{17}{15}$$

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

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

⑤



$$\therefore \sin \theta = \frac{\sqrt{85}}{11}$$

$$\csc \theta = \frac{11}{\sqrt{85}} \cdot \frac{\sqrt{85}}{\sqrt{85}} = \frac{11\sqrt{85}}{85} = \csc \theta$$

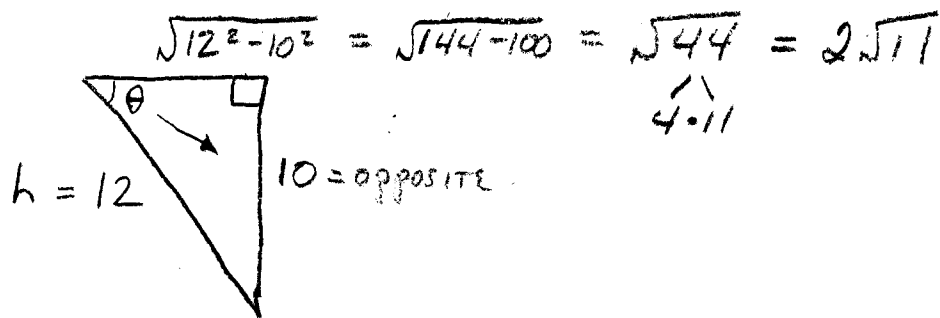
$$\cos \theta = \frac{6}{11}$$

$$\sec \theta = \frac{11}{6}$$

$$\tan \theta = \frac{\sqrt{85}}{6}$$

$$\cot \theta = \frac{6}{\sqrt{85}} = \frac{6\sqrt{85}}{85} = \cot \theta$$

⑥



$$\sin \theta = \frac{10}{12} = \frac{5}{6}$$

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

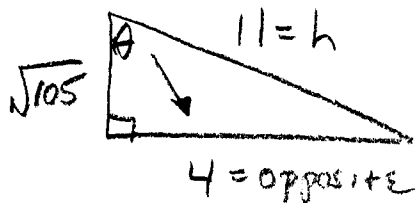
$$\cos \theta = \frac{2\sqrt{11}}{12} = \frac{\sqrt{11}}{6}$$

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

$$\tan \theta = \frac{10}{2\sqrt{11}} = \frac{5}{\sqrt{11}} = \frac{5\sqrt{11}}{11}$$

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

⑮



$$\begin{aligned}
 \text{adjacent} &= \sqrt{11^2 - 4^2} \\
 &= \sqrt{121 - 16} \\
 &= \sqrt{105}
 \end{aligned}$$

$$\begin{array}{r}
 105 \\
 11 \\
 5 \cdot 21 \\
 1 \\
 3 \cdot 7
 \end{array}$$

$$\sin \theta = \frac{4}{11}$$

$$\csc \theta = \frac{11}{4}$$

$$\cos \theta = \frac{\sqrt{105}}{11}$$

$$\sec \theta = \frac{11}{\sqrt{105}} = \frac{11\sqrt{105}}{105}$$

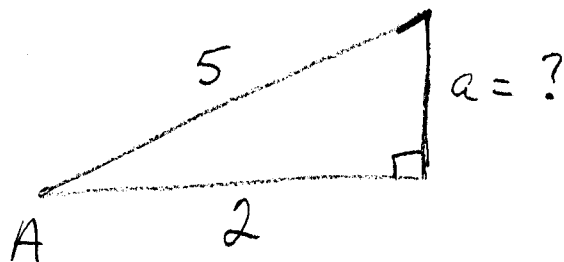
$$\tan \theta = \frac{4}{\sqrt{105}} = \frac{4\sqrt{105}}{105}$$

$$\cot \theta = \frac{\sqrt{105}}{4}$$

Finding one trig. ratio if you already know one. Ex 2 Pg 702

If $\cos A = \frac{2}{5}$, find $\tan A$

*→ Make a drawing, label everything you know.
Use Pythagorean Theorem to find missing side.



$$a = \sqrt{5^2 - 2^2} = \sqrt{25 - 4} = \sqrt{21}$$

$$\therefore \boxed{\tan A = \frac{\sqrt{21}}{2}}$$

Recall: $\sin^{-1}\left(\frac{o}{h}\right) = \text{Angle}$ or $\arcsin\left(\frac{o}{h}\right) = \text{Angle}$

$\cos^{-1}\left(\frac{a}{h}\right) = \text{Angle}$ or $\arccos\left(\frac{a}{h}\right) = \text{Angle}$

$\tan^{-1}\left(\frac{o}{a}\right) = \text{Angle}$ or $\arctan\left(\frac{o}{a}\right) = \text{Angle}$

⊙ $\sin(20^\circ) = ?$ $\sin^{-1}(.3420) = ?$

$\sin(20^\circ) = .3420$ $\sin^{-1}(.3420) \approx 19.9988^\circ \approx 20^\circ$

↑
X = Angle

↑
Y = $\frac{o}{h}$

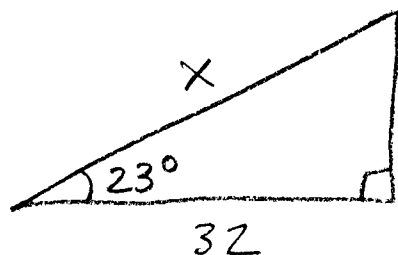
↑
X = $\frac{o}{h}$

↑
Y = Angle

BASIC trig $\Rightarrow$ Find missing side
 $\Rightarrow$ use $\sin$, $\cos$, or $\tan$

$\Rightarrow$ Find missing Angle
 use $\sin^{-1}$, $\cos^{-1}$, or $\tan^{-1}$

EX Find missing side X:



Use trig. function that involves 23° , 32, and X

$$\underset{\substack{\uparrow \\ \text{KNOWN}}}{\cos 23^\circ} = \frac{32}{X}$$

$\uparrow$ ADJACENT $\uparrow$ HYPOTENUSE

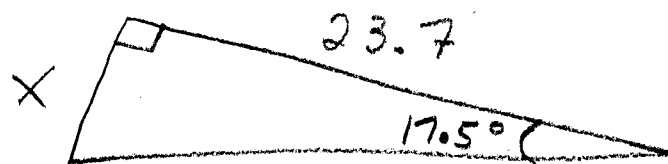
$$X \cdot \cos 23^\circ = \frac{32}{X} \cdot X$$

$$\frac{X \cos 23^\circ}{\cos 23^\circ} = \frac{32}{\cos 23^\circ}$$

$$X = \frac{32}{(.9209)}$$

$$\boxed{X = 34.76} \quad \text{Reasonable? } X \text{ must be } > 32 \checkmark$$

ⓔX Find missing side X:



$$\tan 17.5^\circ = \frac{X}{23.7}$$

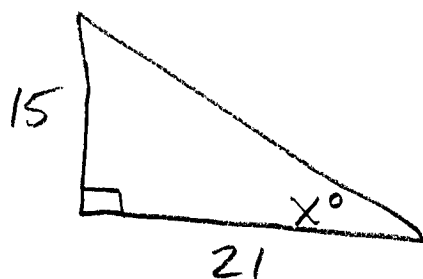
$$23.7 \tan 17.5^\circ = X$$

$$23.7(.3153) = X$$

$$\boxed{7.47 = X}$$

ⓔX Find missing angle X:

↑
need angle, think $\sin^{-1}$, $\cos^{-1}$, or $\tan^{-1}$



$$\tan X = \frac{15}{21} = \frac{5}{7}$$

$$\tan X = .7143$$

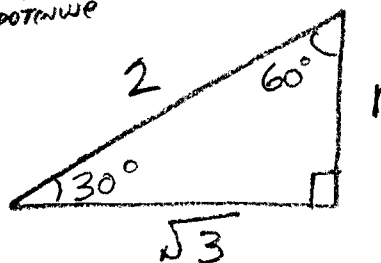
$$\tan^{-1}(.7143) = X$$

$$\boxed{35.5^\circ = X}$$

Two special triangles:

$1, 2, \sqrt{3} \Rightarrow 30, 60, 90$

$\uparrow$ $\uparrow$
 smallest Biggest
 $\downarrow$ $\parallel$
 opposite hypotenuse
 30°



$$\sin 30 = \frac{1}{2}$$

$$\cos 30 = \frac{\sqrt{3}}{2}$$

$$\tan 30 = \frac{1}{\sqrt{3}} \text{ or } \frac{\sqrt{3}}{3}$$

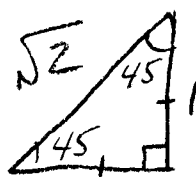
$$\sin 60 = \frac{\sqrt{3}}{2}$$

$$\cos 60 = \frac{1}{2}$$

$$\tan 60 = \frac{\sqrt{3}}{1} = \sqrt{3}$$

$1, 1, \sqrt{2} \Rightarrow 45, 45, 90$

$\uparrow$
 biggest



$$\sin 45^\circ = \cos 45^\circ = \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$$

$$\tan 45^\circ = 1$$

Homework: Pg 707 # 21, 22, 23, 25, 26