



IF YOU KNOW THIS,
YOU KNOW **A LOT!**

SOH **C**AH **T**OA

IF YOU KNOW THIS,
YOU KNOW **A LOT!**

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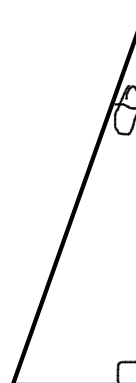
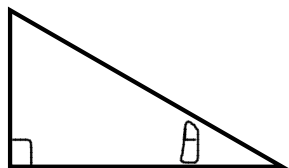
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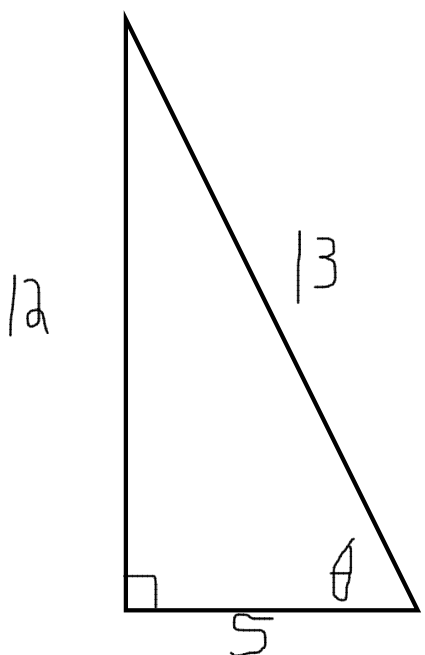
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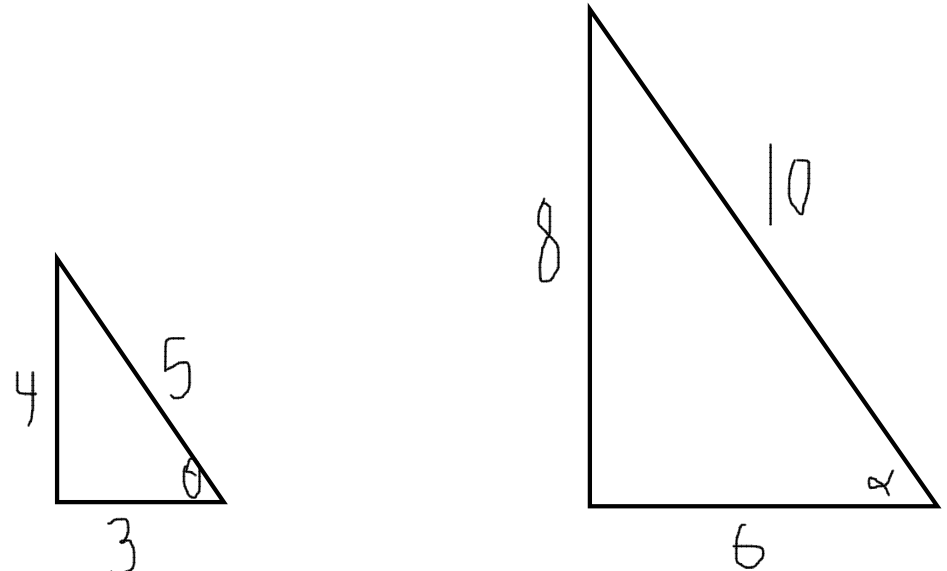
label the sides:

opposite
adjacent
hypotenuse





$\sin \theta =$
 $\cos \theta =$
 $\tan \theta =$



$\sin \theta$
 $\cos \theta$
 $\tan \theta$

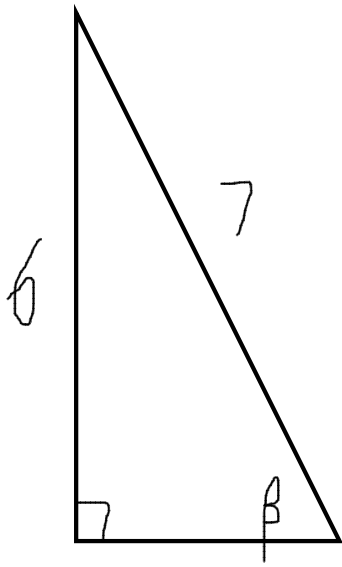
$\sin \alpha$
 $\cos \alpha$
 $\tan \alpha$

IMPERATIVE!

Draw a mathematical conclusion from the last set of triangles!

the trigonometric function values of an angle do NOT depend on the **size** of the triangle

(but instead depend on the ratio/proportion of the sides)



Find the:

$$\sin \beta$$

$$\cos \beta$$

$$\tan \beta$$

Given: $\tan(x)=2$.

Find: $\sin(x)=$

$\cos(x)=$

Check yo'self!

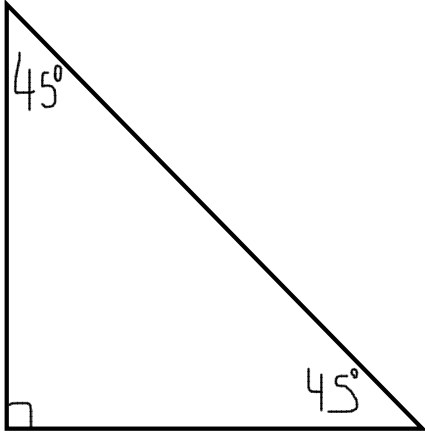
Given: $\cos(x) = 24/25$

Find: $\sin(x) =$

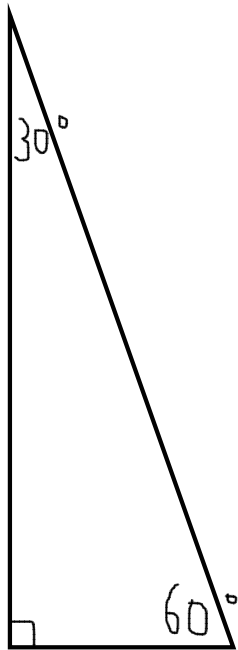
$\tan(x) =$

SPECIAL RIGHT TRIANGLES

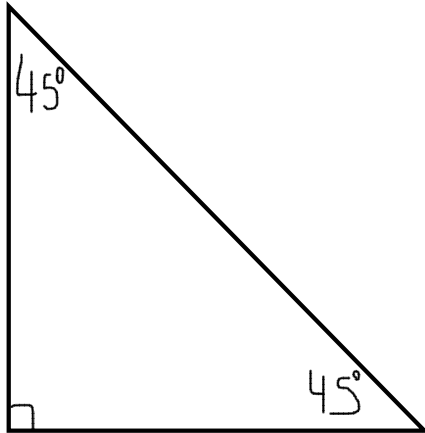
45-45-90



30-60-90

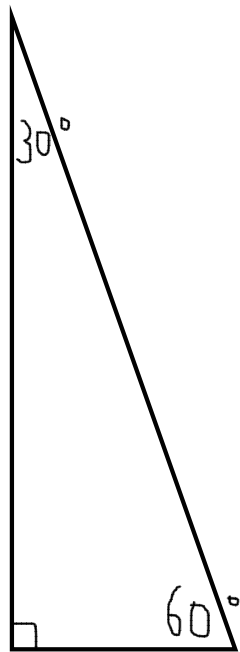


45-45-90



$$\begin{aligned}\sin(45^\circ) &= \\ \cos(45^\circ) &= \\ \tan(45^\circ) &= \end{aligned}$$

30-60-90



$$\begin{aligned}\sin(30^\circ) &= \\ \cos(30^\circ) &= \\ \tan(30^\circ) &= \end{aligned}$$

$$\begin{aligned}\sin(60^\circ) &= \\ \cos(60^\circ) &= \\ \tan(60^\circ) &= \end{aligned}$$

Let's be clear...

$\sin()$

$\cos()$

$\tan()$

are **functions!**

they take in an **input** (an **angle**)

and spew out an **output** (a ratio of **sides**)

NEW FUNCTIONS! NEW FUNCTIONS! NEW
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FUNCTIONS! NEW FUNCTIONS! NEW

(but actually...
not so new)

cosecant $\csc(x)$

secant $\sec(x)$

cotangent $\cot(x)$

hyp/opp $\csc(x)$

hyp/adj $\sec(x)$

adj/opp $\cot(x)$

$1/\sin(x)$ $\csc(x)$

$1/\cos(x)$ $\sec(x)$

$1/\tan(x)$ $\cot(x)$

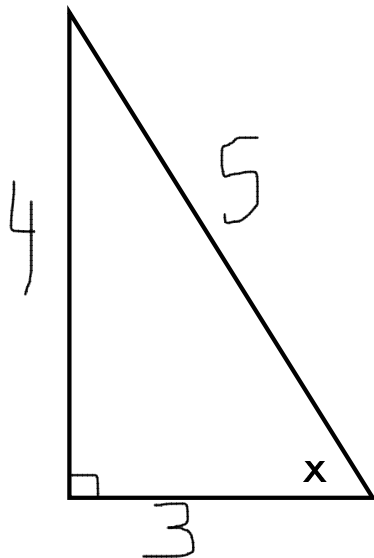
how I remember this

S and **C** go together!

sin(x) and **c**sc(x)

cos(x) and **s**ec(x)

and obviously **t**an(x) and **c**ot(x) go together



$$\sin(x) =$$

$$\csc(x) =$$

$$\cos(x) =$$

$$\sec(x) =$$

$$\tan(x) =$$

$$\cot(x) =$$

Given: $\csc(x)=1.5$

Find: the value of the other five trig functions!

Lastly, here are some identities:

$$\sin(90^\circ-\theta)=\cos(\theta)$$

$$\cos(90^\circ-\theta)=\sin(\theta)$$

$$\csc(90^\circ-\theta)=\sec(\theta)$$

$$\sec(90^\circ-\theta)=\csc(\theta)$$

Lastly, here are some identities:

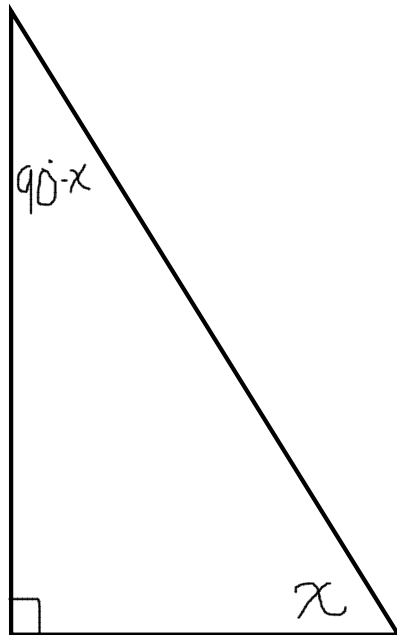
$$\sin(90^\circ - \theta) = \cos(\theta)$$

$$\cos(90^\circ - \theta) = \sin(\theta)$$

$$\csc(90^\circ - \theta) = \sec(\theta)$$

$$\sec(90^\circ - \theta) = \csc(\theta)$$

WHY?



HW: Section 5.1 #1-3,6,7,9-15 odd, 17-28(all),29