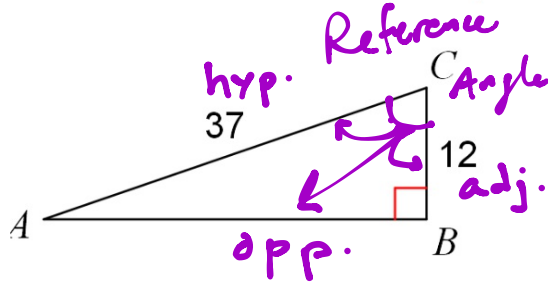


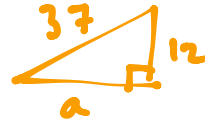
SOH CAH TOA

Good afternoon: warm up in notes



1. Find $\sin C$
2. Write 2 trig ratios that are equal to $12/37$

1.) $\sin C = \frac{\text{opp}}{\text{hyp}} = \frac{12}{AB}$? $\frac{12}{35}$



$$a^2 + 12^2 = 37^2$$

$$a^2 + 144 = 1369$$

$$a^2 = 1225 \Rightarrow a = \underline{\underline{35}}$$

2.) From C, 12 is adjacent and 37 is hyp. so, $\cos C$

Reminder:
retakes in DS tomorrow
assessment Monday

From A, 12 is opposite!
37 still hypotenuse,

so: $\sin A$

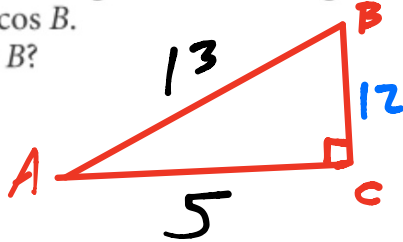
Note: can't say $\cos B$,
because is 12 adjacent?
or 35???

SOHCAHTOA

11. Given $\sin B = \frac{5}{13}$, draw a right triangle ABC with right angle C and

label the side lengths.

- Determine the length of the missing side.
- Determine $\cos B$.
- What is $\tan B$?



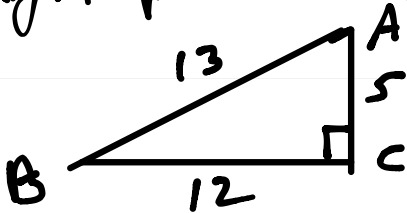
$$\sin B = \frac{5}{13} \leftarrow \begin{array}{l} \text{opposite of B} \\ \text{hypotenuse} \end{array}$$

$$\begin{aligned} \text{a.) } 5^2 + a^2 &= 13^2 \\ 25 + a^2 &= 169 \\ a^2 &= 144 \Rightarrow \underline{a=12} \end{aligned}$$

$$\text{b.) } \cos B = \frac{\text{adj of B}}{\text{hyp}} = \frac{12}{13}$$

$$\begin{aligned} \text{c.) } \tan B &= \frac{\text{opposite}}{\text{adjacent}} \quad (\text{relative to B!}) \\ &= \frac{5}{12} \end{aligned}$$

Might put A & B differently...



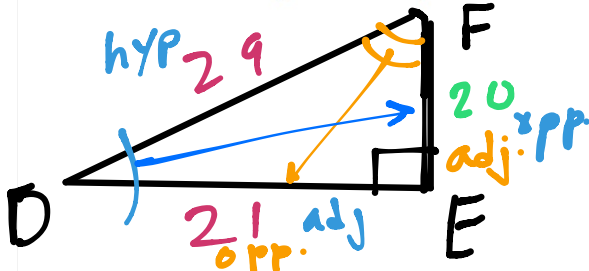
$$\text{b.) } \cos B = \frac{12}{13}$$

$$\text{c.) } \tan B = \frac{5}{12}$$

SOH CAH TOA

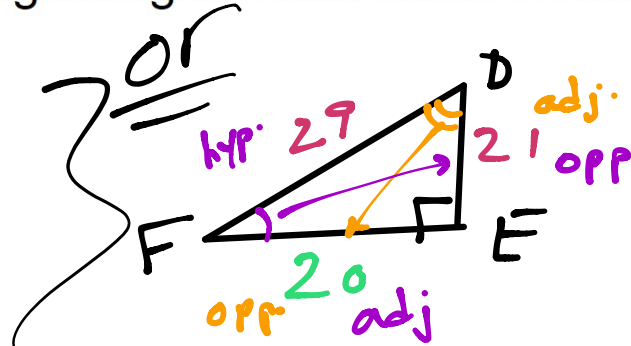
adj. hyp.
↓ ↓

Given right triangle DEF with right angle E and $\cos D = 21/29$
Find $\sin D$, $\tan F$, and $\sin F$.



$$\begin{aligned}21^2 + b^2 &= 29^2 \\441 + b^2 &= 841 \\b^2 &= 400 \\b &= 20\end{aligned}$$

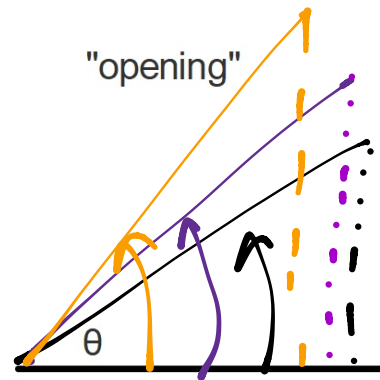
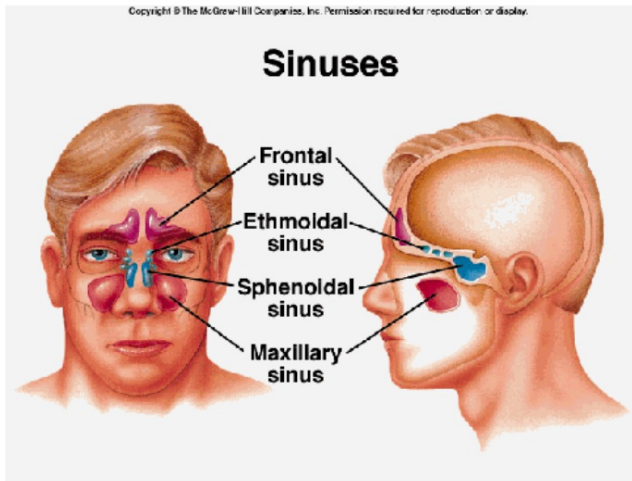
$$\begin{aligned}\sin D &= 20/29 \\ \tan F &= 21/20 \\ \sin F &= 21/29\end{aligned}$$



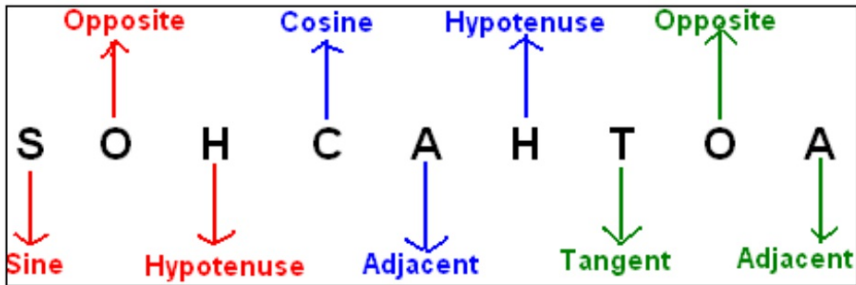
$$\begin{aligned}\sin D &= 20/29 \\ \tan F &= 21/20 \\ \sin F &= 21/29\end{aligned}$$

A comment:

why is it called "sine"



So you think you understand SohCahToa...

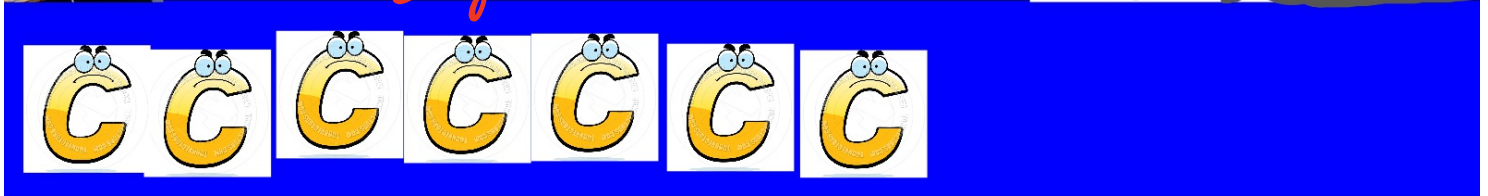
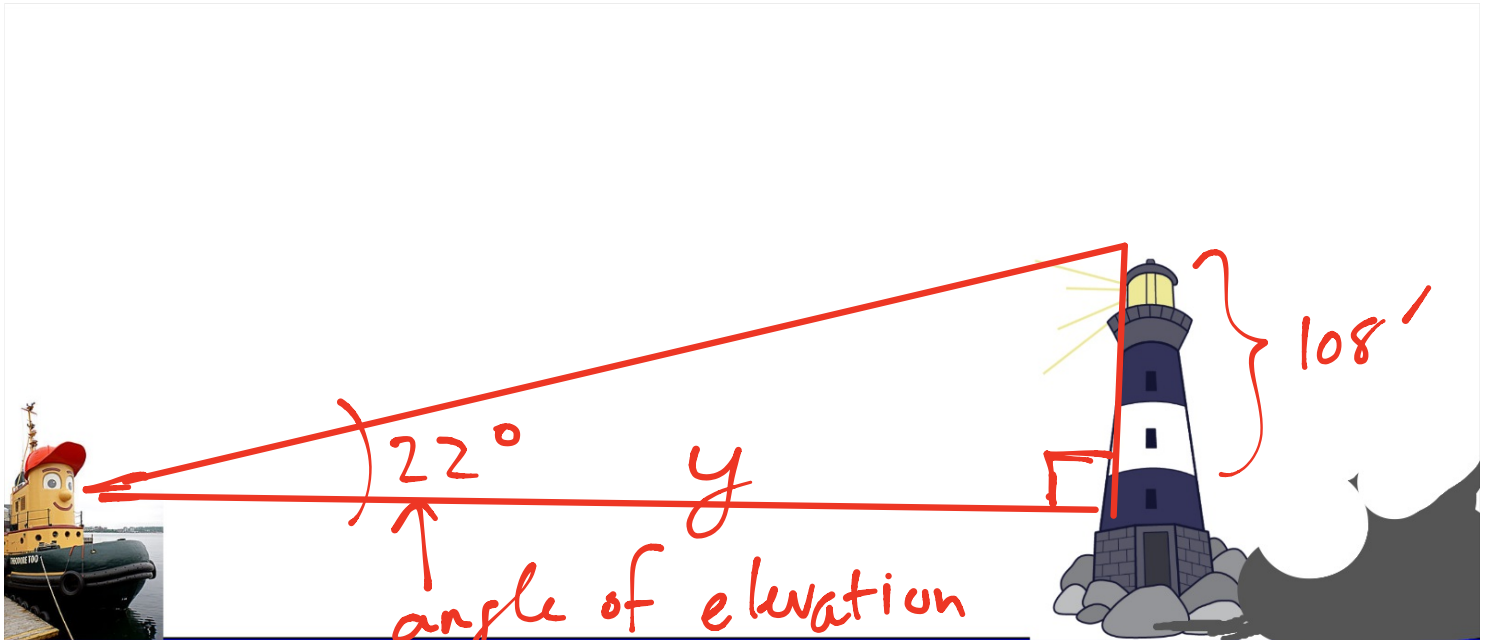


But so far all we have done is play around with numbers inside of triangles and make different combinations.

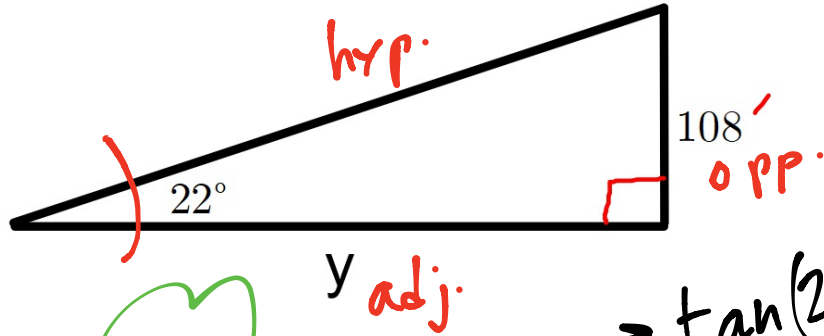
A ship is in heavy fog and the captain is unsure how far away the rocky coast is.

The captain spots a lighthouse he knows to be 108 feet tall. The angle of elevation up to the top of the lighthouse is 22° measured using a clinometer.





SOH CAH TOA



- Locate reference angle
- Identify opp/adj/hyp
- Determine best trig function
- Set up equation
- Solve

Have Adjacent...
Want opposite.
SOH CAH TOA

$$\tan(22^\circ) = \frac{108}{y}$$

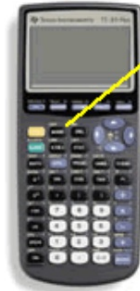
← opp
← adj.



$$0.404 = \frac{108}{y}$$

$$\cancel{0.404} = \frac{108}{y}$$

$$\frac{0.404 \cdot y}{.404} = \frac{108}{.404}$$

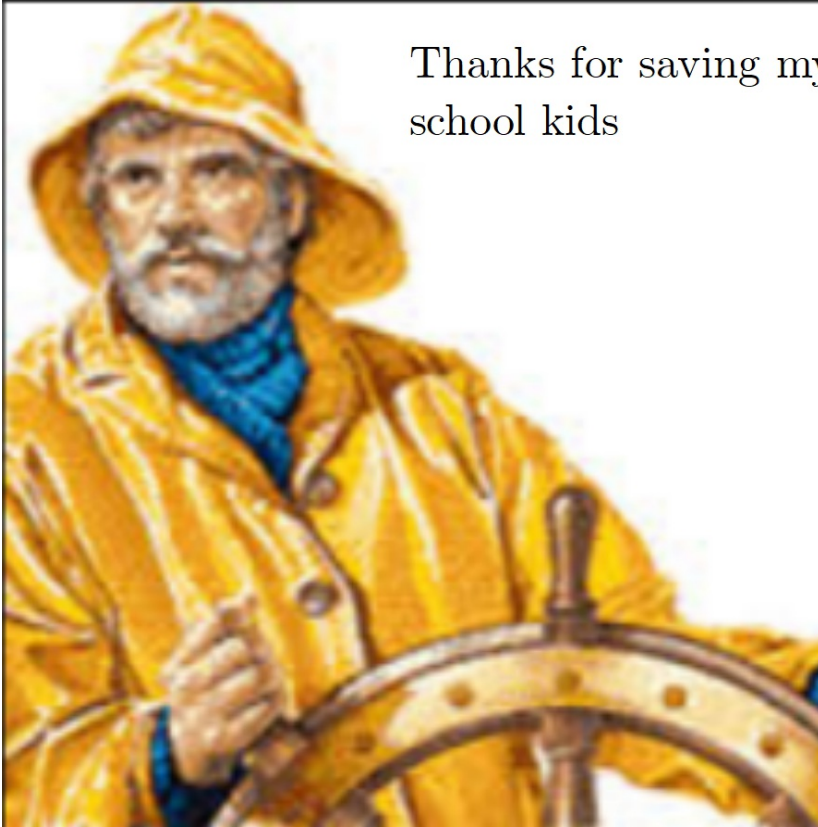


MODE

MODE window

| | | |
|------------|--------|----------|
| Normal | Sci | Eng |
| Float | 01 | 23456789 |
| Radian | Degree | |
| Func | P1 | P2 |
| Connected | Dot | |
| Sequential | Simul | |
| Real | at&B | re^@B |
| Fix | Horiz | G-T |

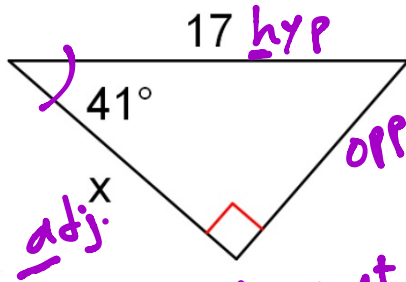
$$y = \boxed{267.3'}$$



Thanks for saving my life
school kids

SOH CAH TOA

Let's try s'more!



want adjacent,
have hypotenuse
CO sine!!

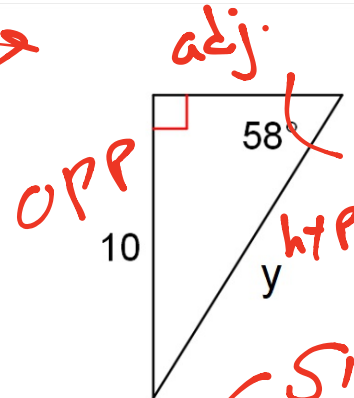
- Locate reference angle
- Identify opp/adj/hyp
- Determine best trig function
- Set up equation
- Solve

$$\cos(41) = \frac{x}{17}$$

$$0.755 = \frac{x}{17}$$

$$\frac{0.755 \times 17}{1} = \frac{x}{17}$$

$$x = 12.87$$



want hyp...
have opposite...
use Sine!

$$\sin(58) = \frac{10}{y}$$

$$0.848 = \frac{10}{y}$$

$$\frac{0.848}{1} = \frac{10}{y}$$

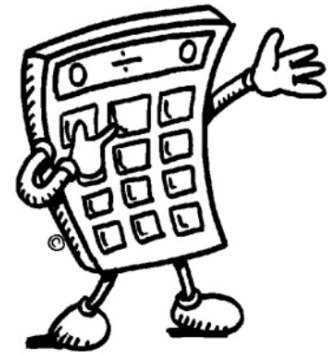
$$0.848y = 10$$

$$\frac{0.848y}{.848} = \frac{10}{.848}$$

$$y = 11.79$$

What is the calculator doing when you type in something like:

$\cos(39)$



and the calculator says 0.7771459...??

Before calculators, mathematicians and students alike had to use "trig tables" which were books full of data that others had calculated by hand. Since similar right triangles keep side proportions, these ratios could be used so long as you knew the angle measure.

61

| | Sinus | Tangens | Secans |
|----|---------|----------|----------|
| 29 | 9680748 | 38020782 | 39894421 |
| 28 | 9680018 | 38574537 | 39849654 |
| 27 | 9679288 | 38528396 | 39804991 |
| 26 | 9678557 | 38482358 | 39760431 |
| 25 | 9677825 | 38436424 | 39715975 |
| 24 | 9677092 | 38390591 | 39671621 |
| 23 | 9676358 | 38344861 | 39627369 |
| 22 | 9675624 | 38299233 | 39583219 |
| 21 | 9674888 | 38253707 | 39539171 |
| 20 | 9674152 | 38208281 | 39495224 |
| 19 | 9673415 | 38162957 | 39451379 |
| 18 | 9672678 | 38117733 | 39407633 |
| 17 | 9671939 | 38072609 | 39363988 |
| 16 | 9671200 | 38027585 | 39320443 |
| 15 | 9670459 | 37982661 | 39276997 |
| 14 | 9669718 | 37937835 | 39233651 |
| 13 | 9668977 | 37893109 | 39190403 |

Need the ratio of adjacent leg to hypotenuse for a 39° angle?

Look it up in the table!

The calculator is kind of* doing that.

1619 AD

What will be on Monday's assessment?

New skills

- special right triangles: similar to hand out hw, Mon/Tues warmups
- applying pythagorean theorem: word problems requiring simple Pythagorean solutions
- basic trig: last night's #1-12 handout, tonight's hw

Old skill

- dilations centered at the origin + dilation/area: SRT-A1a

HW

handout #5-10

(numerical answers posted at mgeo.weebly.com)

study for assessment

HW

handout #5-10

(numerical answers posted at mgeo.weebly.com)

study for assessment