The Trigonometric Functions

SINE

COSINE

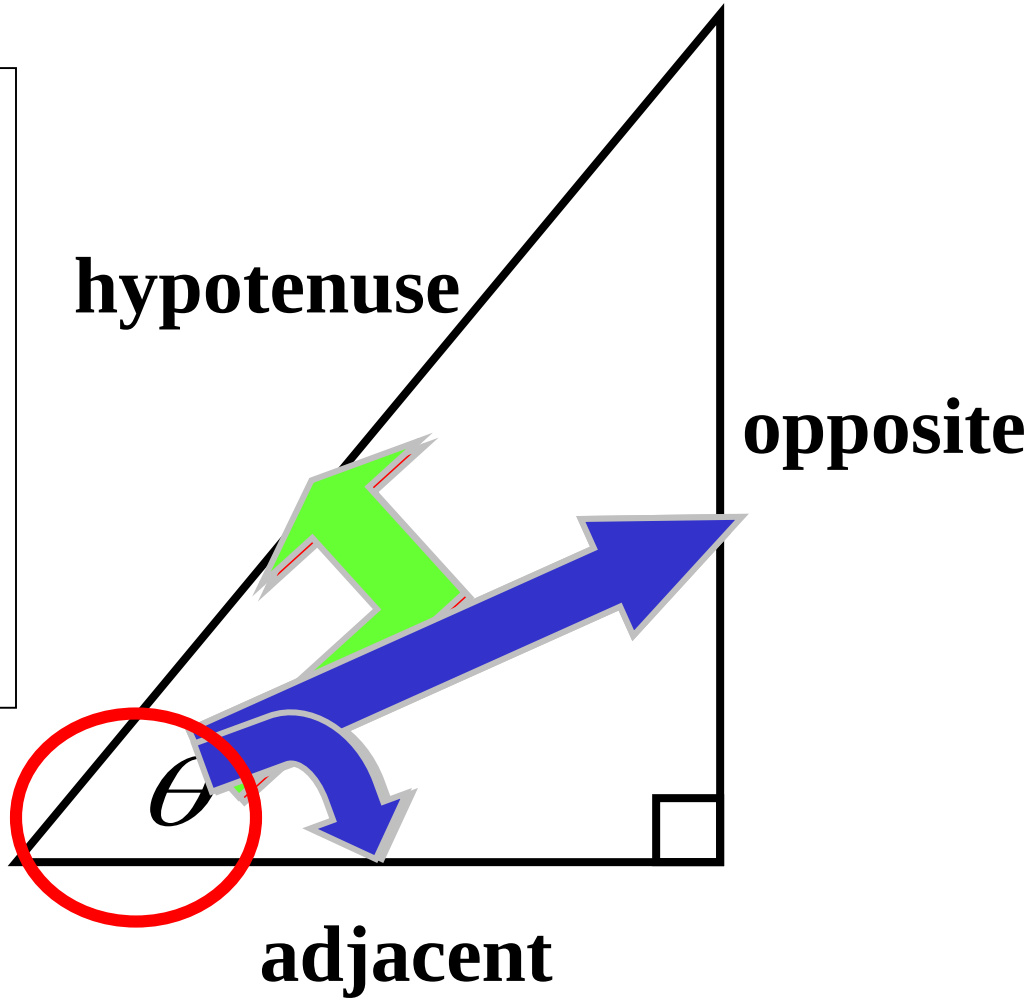
TANGENT

The Greek Letter θ (theta)

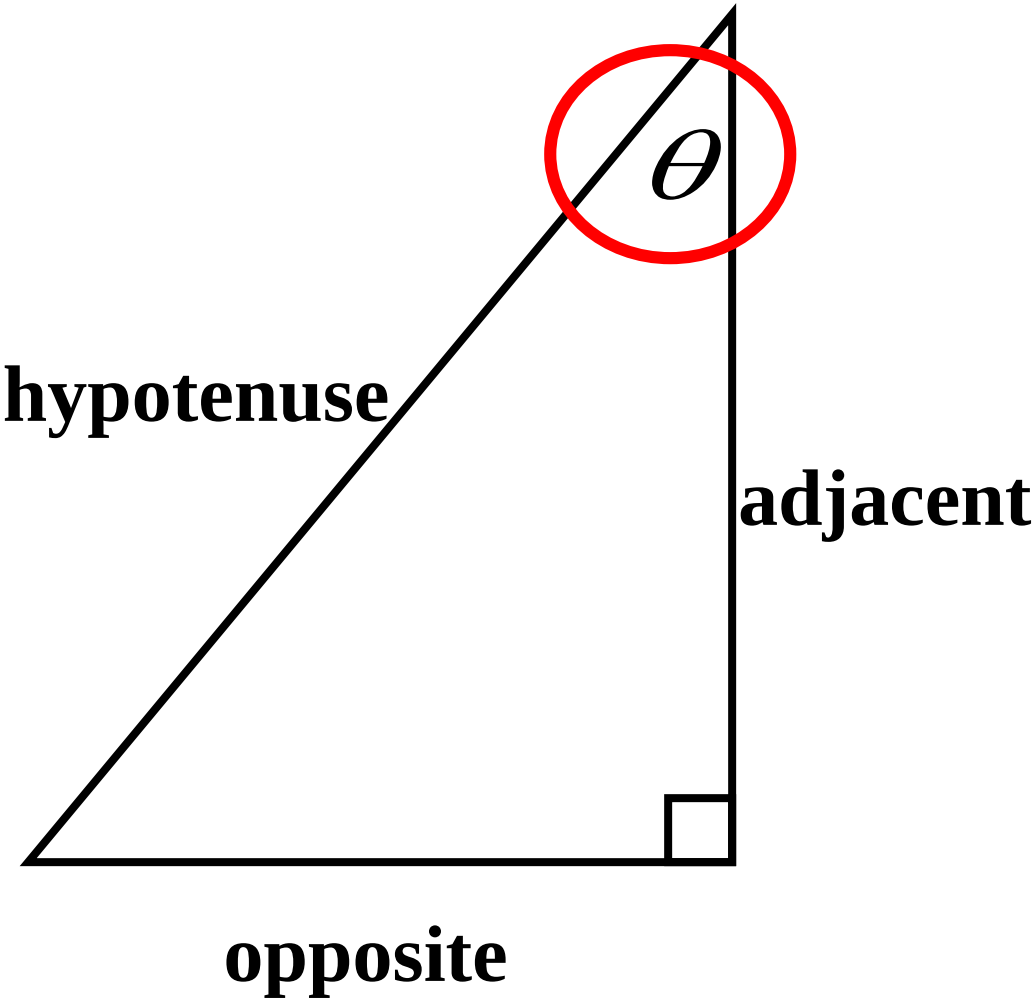
- represents an unknown angle
- represents the reference angle
- pronounced "thay – tu"

FIRST STEP:

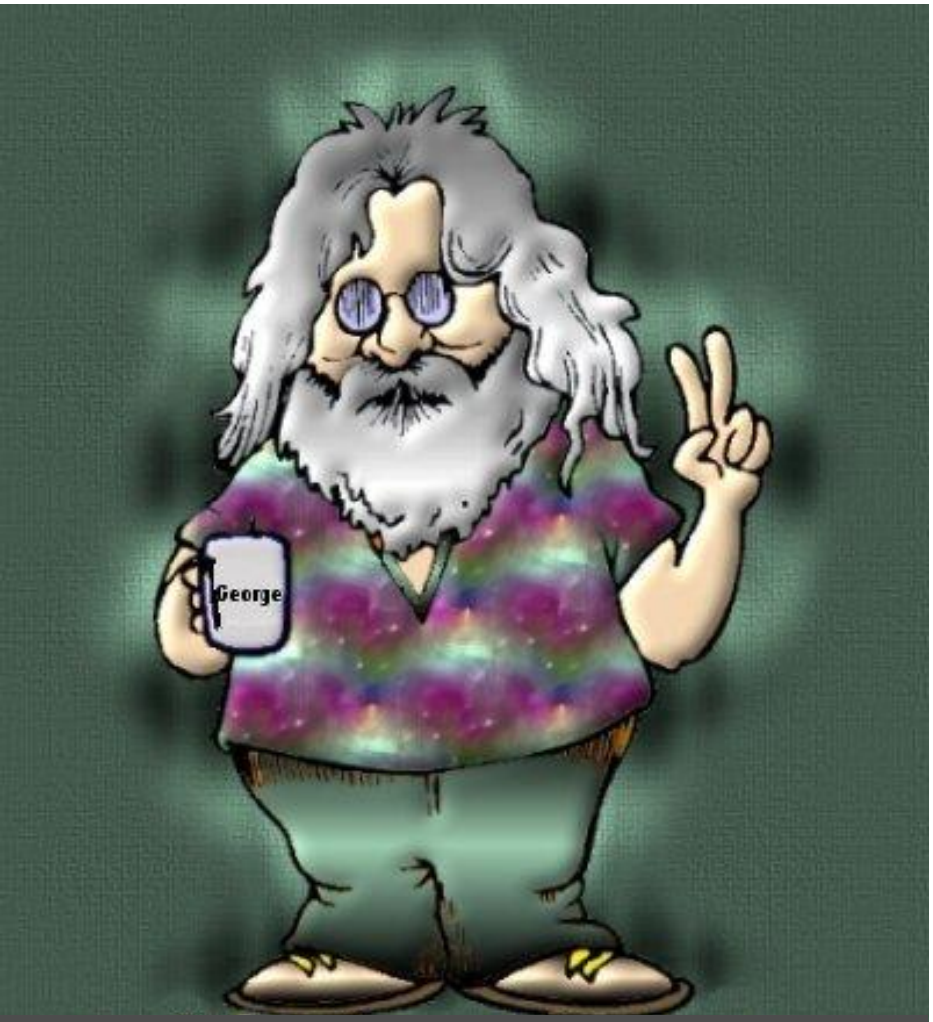
Label the sides of the triangle.



FIRST STEP:
Label the sides of the triangle.



SOHCAHTOA



Old Hippie

Sin
Opp
Hyp

Cos
Adj
Hyp

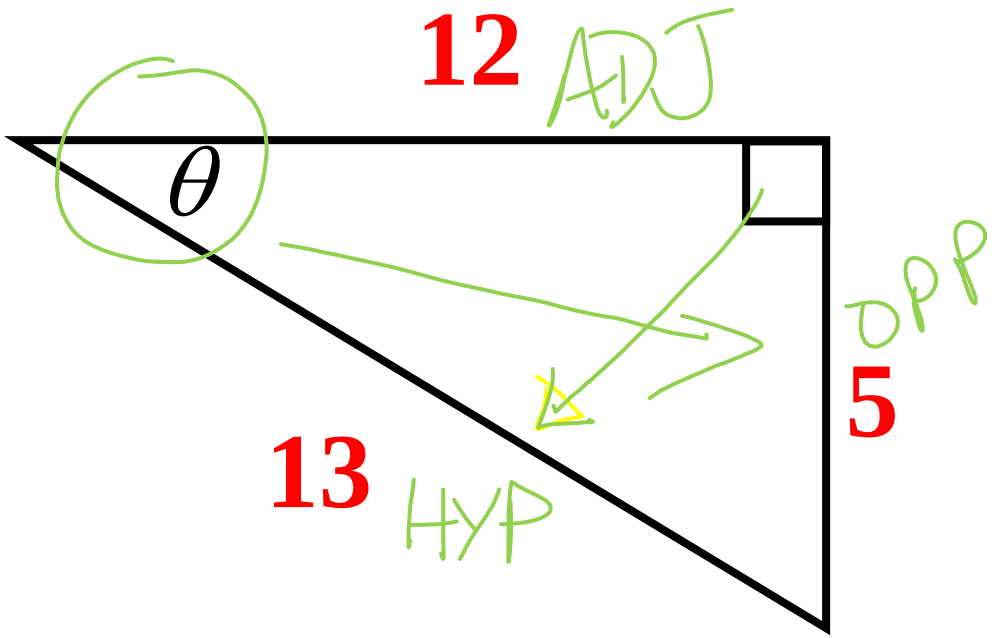
Tan
Opp
Adj

Finding Sin, Cos, and Tan

STEPS:

1) **Circle the reference angle.**
2) **Label the sides of the triangle.**
3) **Use SOHCAHTOA to write ratios.**
4) **Simplify.**

Find ALL 3 Trig Ratios



SOHCAHTOA

$$\sin\theta = \frac{O}{H} = \frac{5}{13}$$

$$\cos\theta = \frac{A}{H} = \frac{12}{13}$$

$$\tan\theta = \frac{O}{A} = \frac{5}{12}$$

SOHCAHTOA

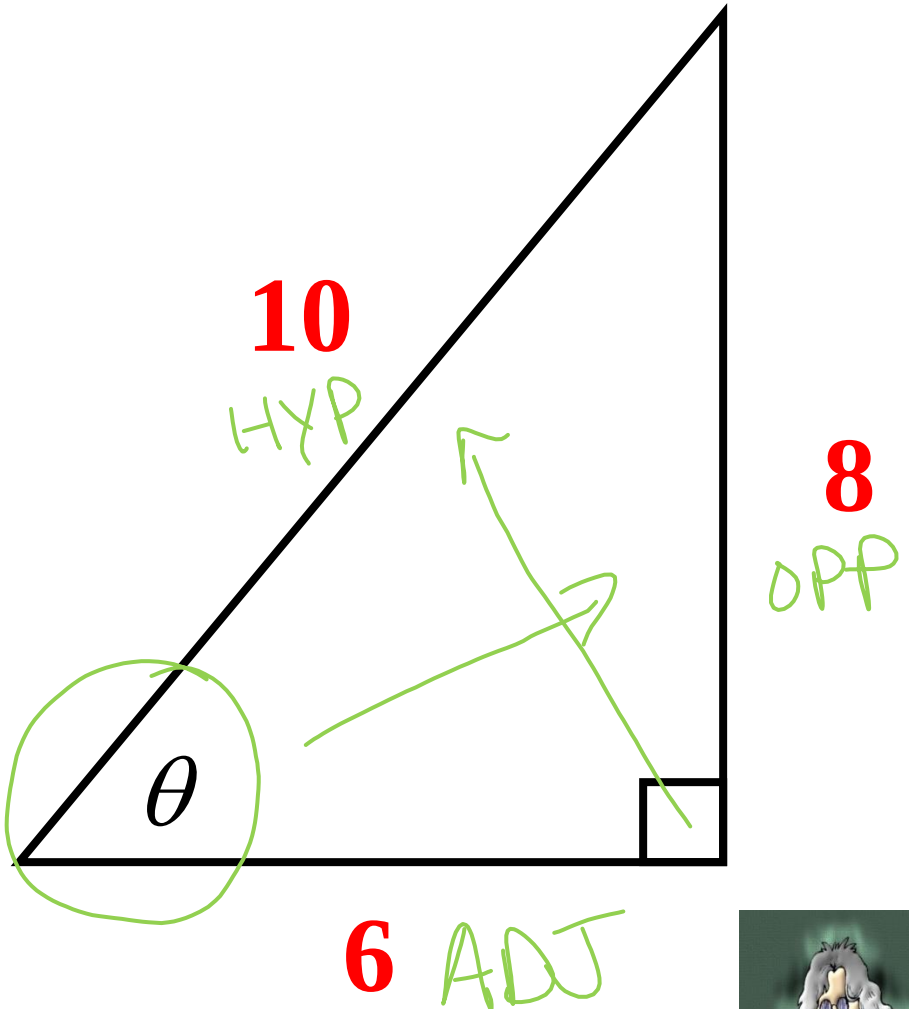
Find ALL 3 Trig Ratios

SOHCAHTOA

$$\sin\theta = \frac{O}{H} = \frac{8}{10} = \frac{4}{5}$$

$$\cos\theta = \frac{A}{H} = \frac{6}{10} = \frac{3}{5}$$

$$\tan\theta = \frac{O}{A} = \frac{8}{6} = \frac{4}{3}$$



SOHCAHTOA

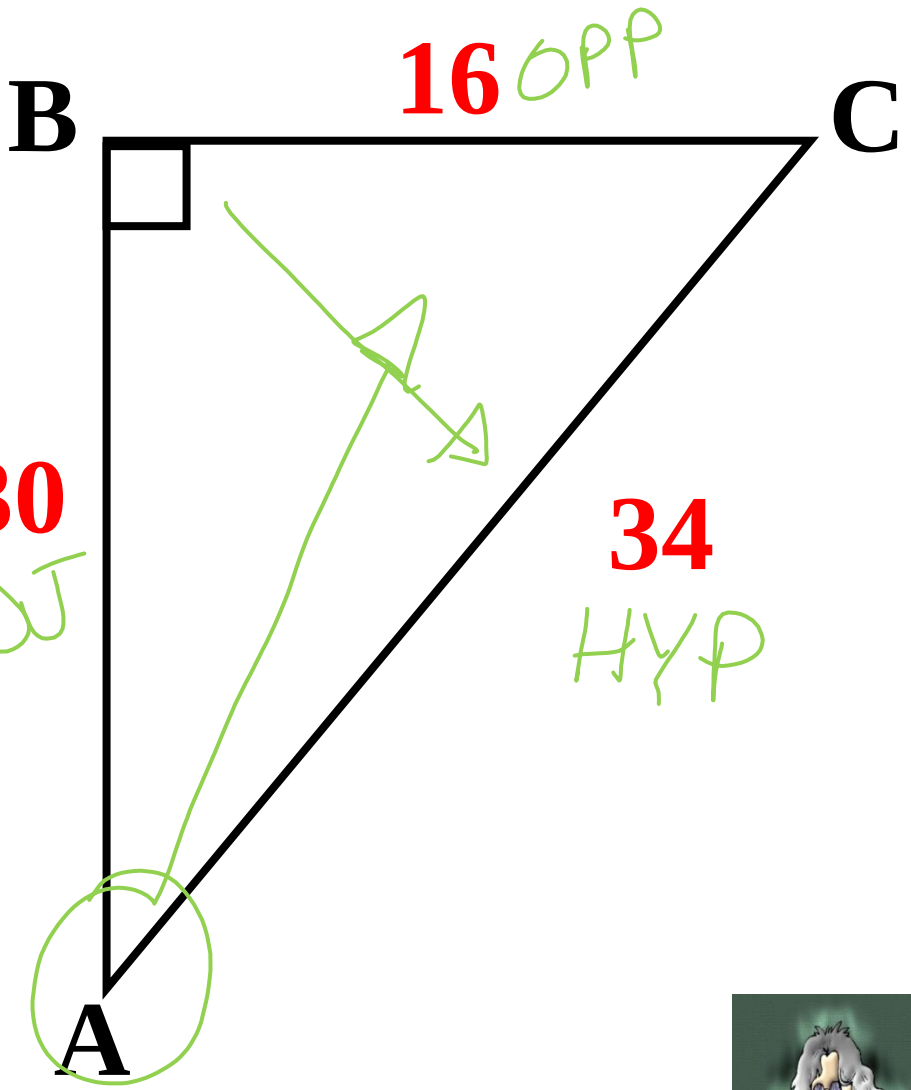
Find sinA, cosA, and tanA.

SOHCAHTOA

$$\sin A = \frac{O}{H} = \frac{16}{34} = \frac{8}{17}$$

$$\cos A = \frac{A}{H} = \frac{30}{34} = \frac{15}{17}$$

$$\tan A = \frac{O}{A} = \frac{16}{30} = \frac{8}{15}$$



SOHCAHTOA

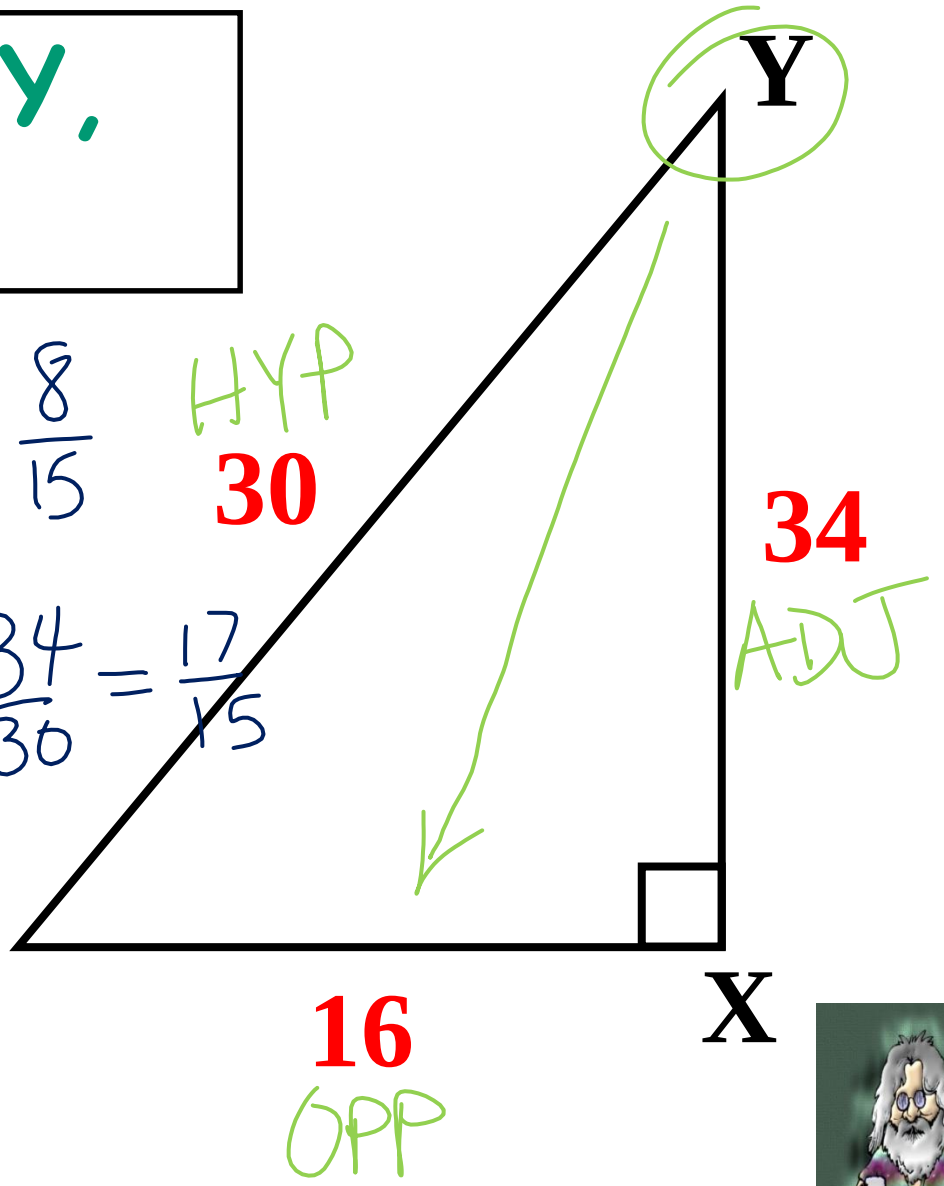
Find sinY, cosY, and tanY.

SOH CAH TOA

$\sin Y = \frac{O}{H} = \frac{16}{30} = \frac{8}{15}$

$\cos Y = \frac{A}{H} = \frac{34}{30} = \frac{34}{30} = \frac{17}{15}$

$\tan Y = \frac{O}{A} = \frac{16}{34} = \frac{8}{17}$



SOHCAHTOA

Finding Trig Ratios when a Side is Missing

First, use the Pythagorean Theorem.

Find ALL 3 Trig Ratios

SOH CAH TOA

$\sin\theta = \frac{O}{H} = \frac{4}{5}$

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

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

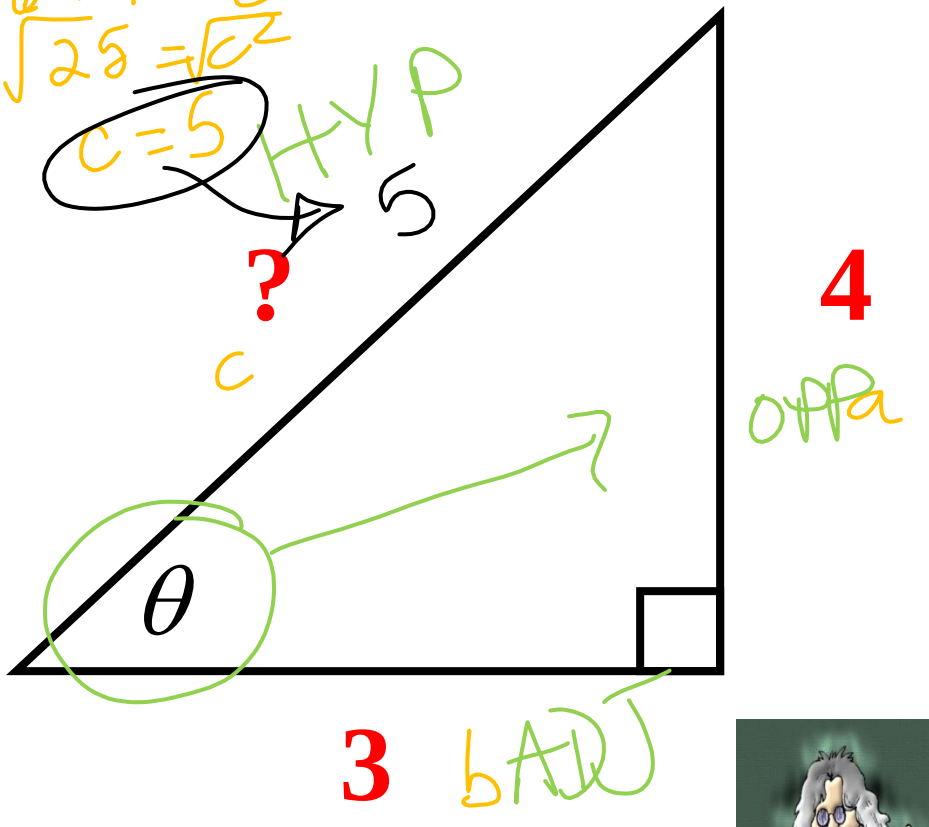
$a^2 + b^2 = c^2$

$(4)^2 + (3)^2 = c^2$

$16 + 9 = c^2$

$\sqrt{25} = \sqrt{c^2}$

$c = 5$



SOHCAHTOA

Find ALL 3 Trig Ratios

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

$(24)^2+b^2=(25)^2$

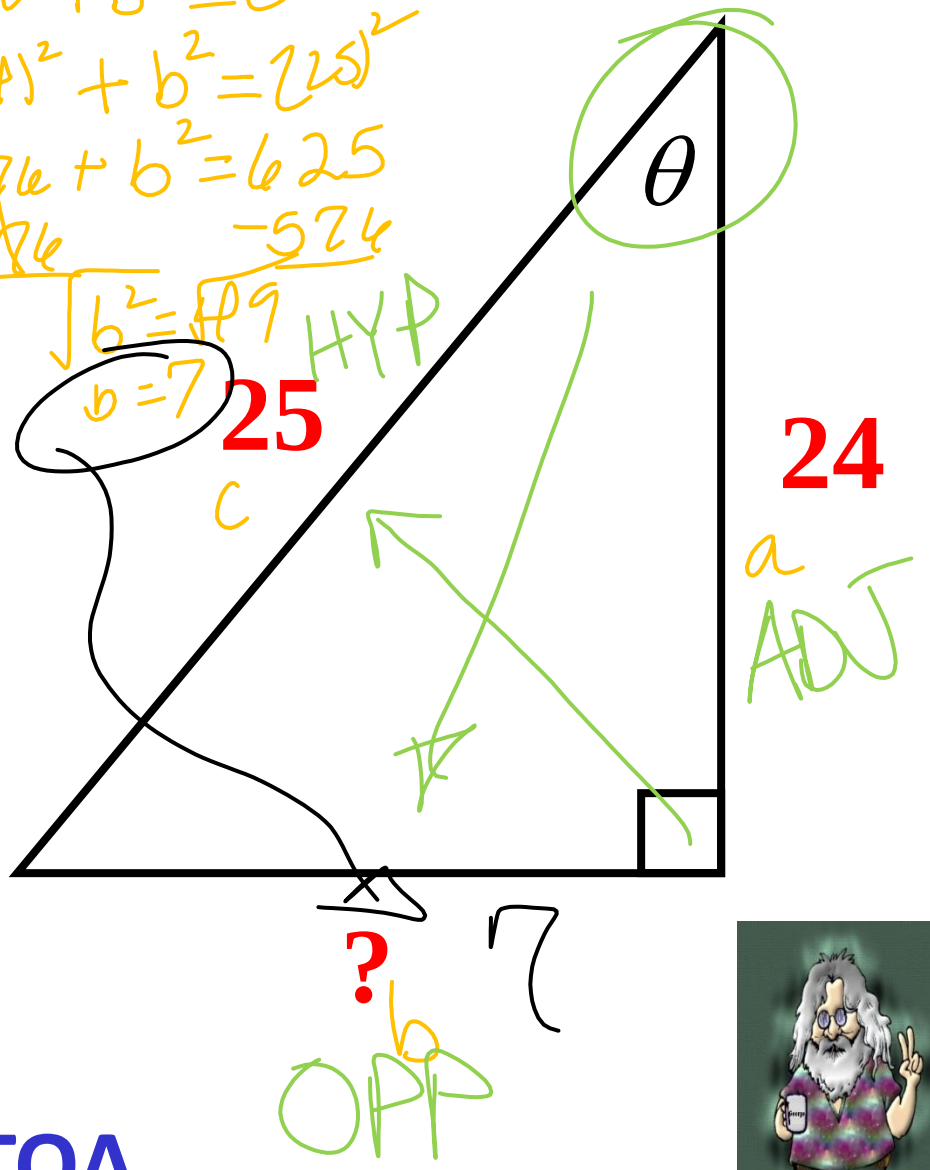
$576+b^2=625$

$-576 \quad -576$

$\sqrt{b^2}=\sqrt{49}$

$b=7$

HYP



SOHCAHTOA

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

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

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

SOHCAHTOA