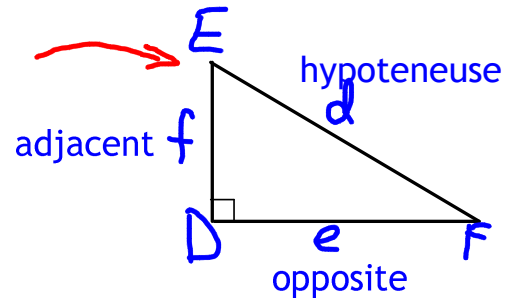


## 1.1 Primary Trig Ratios (Soh Cah Toa)

1. Label this triangle as D,E,F.

Note that the vertices are labeled with CAPITALS and the corresponding sides are lower case.

2. Label each side accordingly for angle  $\hat{E}$



3. State the primary trig ratios for angle  $\hat{E}$

### SOH CAH TOA

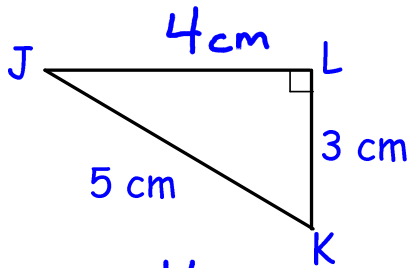
$$\sin \theta = \frac{\text{opp}}{\text{hyp}}$$

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

$$\tan \theta = \frac{\text{opp}}{\text{adj}}$$

Ex. 1: Write the primary trig ratios for angle J and for angle K.

**\*\* you are just setting up the ratio here NOT solving anything\*\***



$$\sin K = \frac{4}{5}$$

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

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

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

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

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

Why don't we do angle L?

-  $90^\circ$

- No opposite/adjacent



Ex. 2: Evaluate using your calculator. Round your answer to 4 decimal places.

Notes:

a)  $\sin 18^\circ = 0.3090$

\* Your calculator gives you the ratio as a decimal instead of a fraction

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

\* Make sure your calculator is set to degrees

*What does this answer tell us?*

Ex. 3: Find the measure of the angle. Round your answer to the nearest tenth of a degree (1 decimal place).

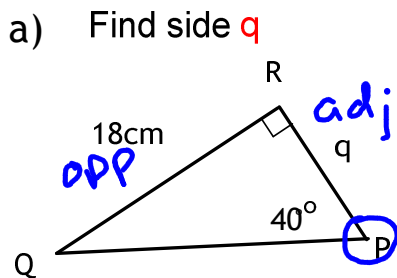
a)  $\cos A = 0.9063$

$$A = \cos^{-1}(0.9063) \\ \approx 25^\circ$$

b)  $\sin Q = \frac{8}{9}$

$$Q = \sin^{-1}\left(\frac{8}{9}\right) \\ \approx 62.7^\circ$$

Ex. 4: Find the length of the indicated side. Round to 2 decimal places.



Which ratio uses opp & adj?  
TAN

$$\tan \theta = \frac{\text{opp}}{\text{adj}}$$

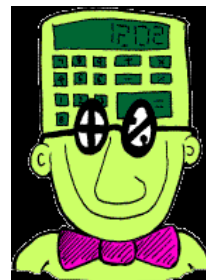
$$\tan 40^\circ = \frac{18}{q}$$

$$q = \frac{18}{\tan 40^\circ}$$

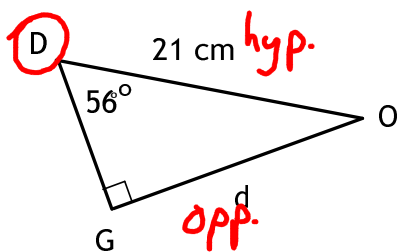
$$q = \frac{18}{0.8390}$$

$$\approx 21.45$$

$$\therefore q = 21.45 \text{ cm}$$



b) Find side  $d$



$$\sin \theta = \frac{\text{opp}}{\text{hyp}}$$

$$\sin 56^\circ = \frac{d}{21}$$

$$21(\sin 56^\circ) = d$$

$$d \approx 17.41$$

$$\therefore d = 17.41 \text{ cm}$$

**3 Steps to Solving**

**Step 1:** Label the sides of your triangle relative to the given angle

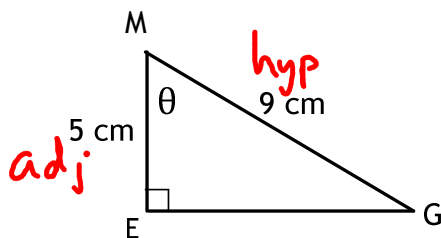
**Step 2:** Determine which trig ratio to use (sin?, cos?, tan?)

**Step 3:** Set up the equation with the unknown side and solve.

Ex. 5: Find the measure of the indicated **angle**.  
Round to the nearest tenth of a degree.



a) Find angle **M**



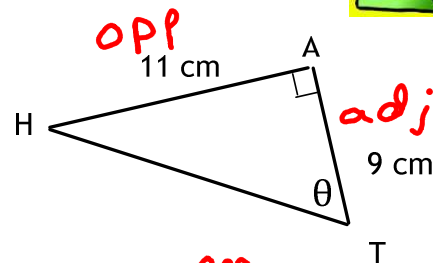
$$\cos \theta = \frac{\text{adj}}{\text{hyp}}$$

$$\cos M = \frac{5}{9}$$

$$M = \cos^{-1}\left(\frac{5}{9}\right)$$

$$M \approx 56.3^\circ$$

b) Find angle **T**



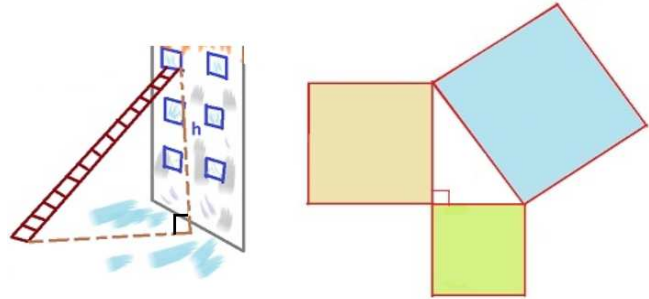
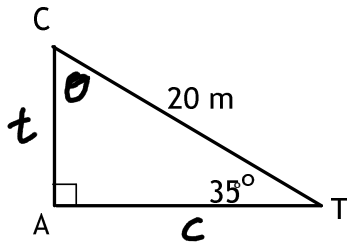
$$\tan \theta = \frac{\text{opp}}{\text{adj}}$$

$$\tan \theta = \frac{11}{9}$$

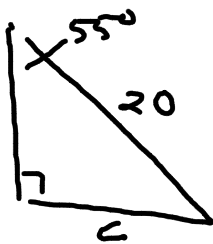
$$\theta = \tan^{-1}\left(\frac{11}{9}\right)$$

$$\approx 50.7^\circ$$

Ex.6: Solve the following triangle.



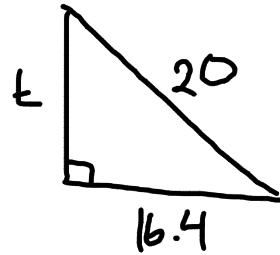
$$\theta = 180 - 35 - 90 = 55^\circ$$



$$\sin \theta = \frac{\text{opp}}{\text{hyp}}$$

$$\sin 55^\circ = \frac{c}{20}$$

$$20(\sin 55^\circ) = c \\ c \approx 16.4$$

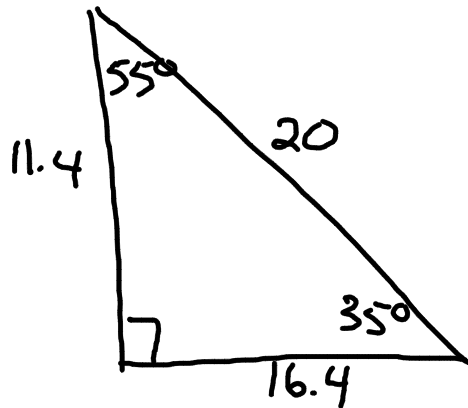


$$20^2 = t^2 + 16.4^2$$

$$t^2 = 20^2 - 16.4^2$$

$$t = \sqrt{131.04}$$

$$\approx 11.4$$



**Practice:**  
**pg. 13 #1-3, 6-8a, 9-12**

