Unit One: Trigonometry

The Primary Trigonometric Ratios

Trigonometry: The study of triangles (sides and angles)

Trigonometry has been used for centuries in the study of:
- astronomy
- surveying
- geography
- engineering
- physics

In similar right triangles, trigonometry relates the sides of the triangles to the measure of an angle.

The three sides are called:

- **Hypotenuse**: opposite the right angle (always the longest side)
- **Opposite**: the side opposite the reference angle
- **Adjacent**: the side beside the reference angle and the right angle.
1. Given the following triangles label the sides of each triangle with respect to the given angle $(\alpha$ or $\theta)$.

```
\[ \begin{array}{ll}
\text{\alpha} & \text{\theta} \\
\hline
\text{opposite} & \text{opposite} \\
\text{adjacent} & \text{adjacent} \\
\text{hypotenuse} & \text{hypotenuse} \\
\end{array} \]
```

The ratios of corresponding sides will be the same in all right similar triangles.

Names are given for the different ratios that you can write in terms of the sides of the triangle with respect to a reference angle. **SOH CAH TOA**
The acronym SOHCAHTOA helps us remember the names!

Example: Write the three trigonometric ratios for the following triangle.

\[
\begin{align*}
\sin \theta &= \frac{30}{34} \\
\cos \theta &= \frac{16}{34} \\
\tan \theta &= \frac{30}{16}
\end{align*}
\]

https://www.youtube.com/watch?v=4iC-gjKvc7A

Now as practice writing the ratio complete: "Why did the Klutz Lift off a manhole cover and dive in?"