

TRIGONOMETRIC RATIOS — SIN, COS, TAN

— Measurement

1. What is Trigonometry?

- The branch of maths that studies RELATIONSHIPS between SIDES and ANGLES of a triangle.
- The word comes from 3 Greek words:
 - **TRI:** TRI = three
 - **GONIA:** GONIA = angle
 - **METRON:** METRON = measure

2. Right-Angled Triangle

- A triangle with one angle of 90 degrees.
- The side opposite the 90 degree angle is the HYPOTENUSE - always the longest side.
- For any other angle (theta):
 - Side opposite to theta = OPPOSITE (O)
 - Side next to theta (not hyp.) = ADJACENT (A)

3. The Three Trig Ratios

$$\begin{aligned}\sin(\theta) &= \text{Opposite} / \text{Hypotenuse} = O / H \\ \cos(\theta) &= \text{Adjacent} / \text{Hypotenuse} = A / H \\ \tan(\theta) &= \text{Opposite} / \text{Adjacent} = O / A\end{aligned}$$

SOH CAH TOA

$$\sin = \text{Opp}/\text{Hyp} \quad \cos = \text{Adj}/\text{Hyp} \quad \tan = \text{Opp}/\text{Adj}$$

Remember these three words!

4. Values at Standard Angles

	0	30	45	60	90
sin:	0	1/2	1/sqrt2	sqrt3/2	1
cos:	1	sqrt3/2	1/sqrt2	1/2	0
tan:	0	1/sqrt3	1	sqrt3	undef