SOH CAH TOA

- using angles and trig ratios we can solve for different sides of a triangle
- allows us to calculate force in newtons involved in pulling objects, lifting objects, or sliding objects on an inclined surface
- we use the Greek letter theta (θ) to represent angles

3 relationships:

1. \( \sin \theta = \frac{\text{opposite}}{\text{hypotenuse}} \) (SOH)
2. \( \cos \theta = \frac{\text{adjacent}}{\text{hypotenuse}} \) (CAH)
3. \( \tan \theta = \frac{\text{opposite}}{\text{adjacent}} \) (TOA)

- adjacent means side touching the angle
- opposite is the side opposite the angle
- hypotenuse is ALWAYS the longest side

Practice!

Effective force

- the force (N) parallel to the direction of travel of an object
- can be solved using trig ratios and right angled triangles

3 types of effective force questions:

1. Pulling questions

- In a pulling question, the direction of travel is horizontal

![Diagram of pulling question]

This side of the triangle represents the effective force

What is the effective force?
2. Lifting questions

- we need to know weight of object in (N)
- remember \( w = mg \)
- if force applied is greater than weight, then an object can be lifted

If this woman pulls her bag with 45 N of force at an angle of 35°, will she be able to lift her bag off the ground using 25 N of force?

Without trig:

If the suitcase weighs 12 kg, will she be able to lift it off the ground using 120 N of force?

3. Sliding questions

- we need to know the weight of the object in newtons and one angle

When this skiing dog (amazing, I know) weighing 16 kg, goes down a slope at 35°, what is the effective force responsible for his descent?