Year 9 Higher Topic 5

Topic title: Angles and Trigonometry

Angle sums

Angles in a triangle add up to 180°.

Angles in a quadrilateral add up to 360°.

To find the sum of the angles in any polygon use this formula:

Number of sides—2 x 180°

Exterior Angles

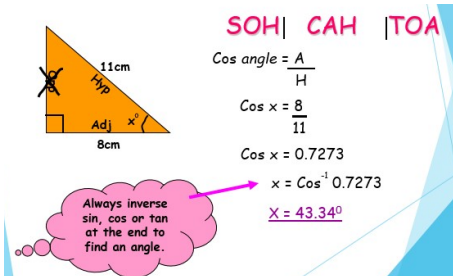
The exterior angles of any polygon add up to 360°.

What careers would use these skills?

Trigonometry is used in the fields of design, music, navigation, cartography, manufacturing, physics, optics, projectile motion,
and anything else which involves angles, waves, harmonics, and vectors

Using trigonometry to calculate a missing angle

There are three trigonometric ratios. Sine, Cosine and Tangent. When working with Sine use opposite and hypotenuse, Cosine uses adjacent and hypotenuse and tangent uses opposite and adjacent. SOH CAH TOA

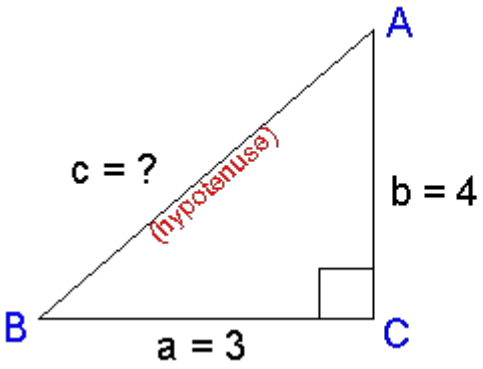


Pythagoras' Theorem

Can only be used for right-angle triangles.

Pythagoras' Theorem states that the square of the hypotenuse is equal to the sum of the square of the two shorter sides.

You can calculate shorter side simply subtract it from the hypotenuse instead of add.



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

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

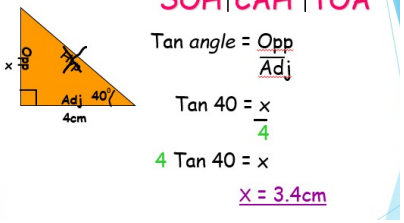
$9 + 16 = c^2$

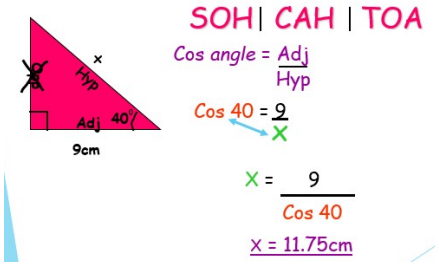
$\sqrt{25} = c$

$c = 5$

Using trigonometry to calculate a missing side.

Use the ratio's in the same way as for an angle but you do not need to use the inverse of the angle.

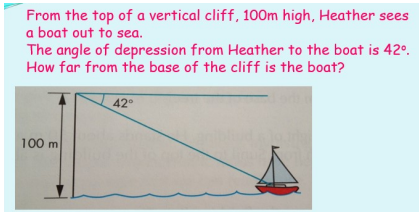




Angles of Elevation and Depression

Angles of elevation are measured form the horizontal upwards.

Angles of depression are measured from the horizontal downwards.



In a question like the one above. The height from the boat up to the horizontal is the same as the height of the cliff. Move the triangle you are working with. It has the same numbers and will give you the same answer but it is easier to work with.