An altitude of a triangle is a line through a vertex.

It is perpendicular to the opposite side but it won't necessarily bisect it.

In engineering, the equation of altitude is used to determine the centre of gravity of a structure.

Triangle ABC has vertices A four, negative five, B five, three and C negative five, two.

Find the equation of the altitude AD.

Start with a sketch.

Calculate the gradient of BC using B and C. M b c equals y two subtract y one divided by x two subtract x one.

This equals two subtract three, over negative five subtract five, which equals negative one over negative ten, which is one over ten.

The gradients of perpendicular lines multiply to give negative one, so the gradient of BC times gradient of AD equals negative one.

The gradient of AD will be negative ten, the negative reciprocal of one over ten.

Find the equation of the altitude AD using the gradient, negative ten, the point A four and negative five.

Substitute the values into the equation y subtract b equals m brackets x subtract a, to get y subtract negative five equals negative ten, bracket x subtract four bracket, which is y plus five equals negative ten x plus 40. Simplify to get y equals negative ten x plus 35.

Remember, altitudes are the perpendicular line drawn from the vertex of the triangle to the opposite side and don't necessarily bisect.