

All triangles follow the same trigonometric rules.

The sine rule can be used to find a missing side or angle in any triangle.

To find a missing side we need to know the opposite angle, the length of a side, and the angle opposite that.

So, to find side CD, we have the length of side BC, 20 centimetres, the opposite angle, 37 degrees, and angle CBD, which is 105 degrees.

Now apply the sine rule: $CD \text{ over } \sin 105 \text{ equals } 20 \text{ over } \sin 37$

Rearrange to get $CD \text{ equals } 20 \text{ times } \sin 105 \text{ over } \sin 37$.

Which is 32 point one centimetres.

To find a missing angle, we need to know the length of the opposite side, and of another side, and the angle opposite that.

To find the angle DFE:

Use the sine rule, $\sin DFE \text{ over } 150 \text{ equals } \sin 66 \text{ over } 140$.

Now isolate DFE. $\sin DFE \text{ equals } 150 \sin 66 \text{ over } 140$.

Angle DFE equals the inverse sine function of $150 \sin 66 \text{ over } 140$, which is 78 point one eight degrees.

The sine rule is used when there are two angles and one side, or two sides and an angle.