**Skill Sheet: Pythagoras Theorem**

***What You Need to Know:***

You might be asked to calculate the length of one side of a triangle. For example, this could be used to mark out a part for cutting or to calculate the length of a taper on a turned part.

One way to do this is using Pythagoras theorem. This can be used when it is a **right-angled triangle** and **the lengths of two sides are known**.

Where A, B and C are the lengths of the sides shown on the figure, Pythagoras Theorem states:

B

C

A

C2 = A2 + B2 (where C is the longest side)

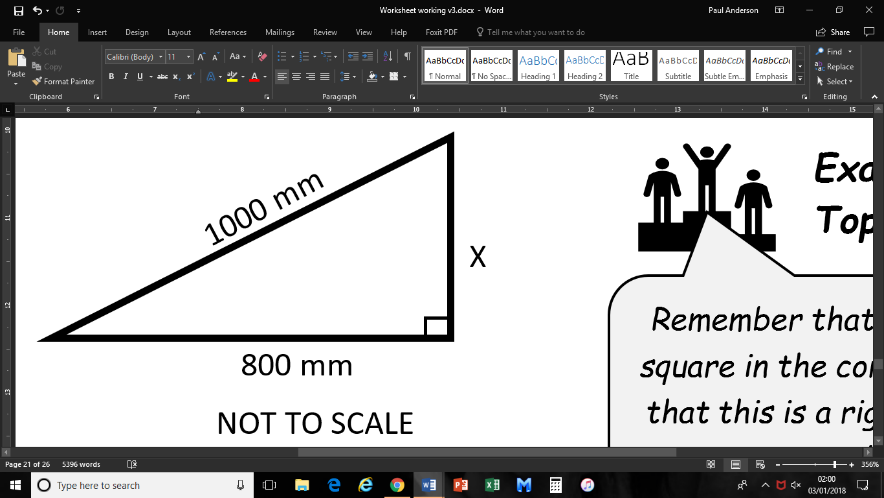
The length of any side can be found by rearranging this formula:

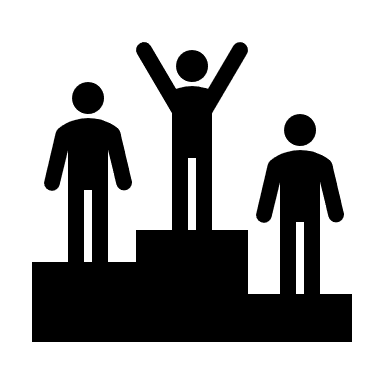
C = √ (A2 + B2)

A = √ (C2 - B2)

B = √ (C2 - A2)

***Example:***

The right-angled triangle shown needs to be marked out on a sheet of material.



***Examiners***

***Top Tip***

*Remember that the little square in the corner shows that this is a right-angled triangle*

Calculate the length of side X.

***Answer:***

Using Pythagoras Theorem,

NOT TO SCALE

X = √ (10002 - 8002) = √ (360000) = 600 mm

***Now Try These:***

1. A piece of material is needed to repair a machine. Calculate the length of side C.

480 mm

C

640 mm

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1. A piece of material is being marked out for cutting. Calculate the length of side X to 2 decimal places.

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X

1.02 m

0.55m

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**Practice Sheet: Pythagoras Theorem**

***Now Try These:***

1. A taper is being cut on a lathe. Calculate the length of the taper, Y, to the nearest whole number.

24 mm

Y

95 mm

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1. A template needs is being made to check the shape of a triangular structure.

Calculate the length of the side A.

A

1.35 m

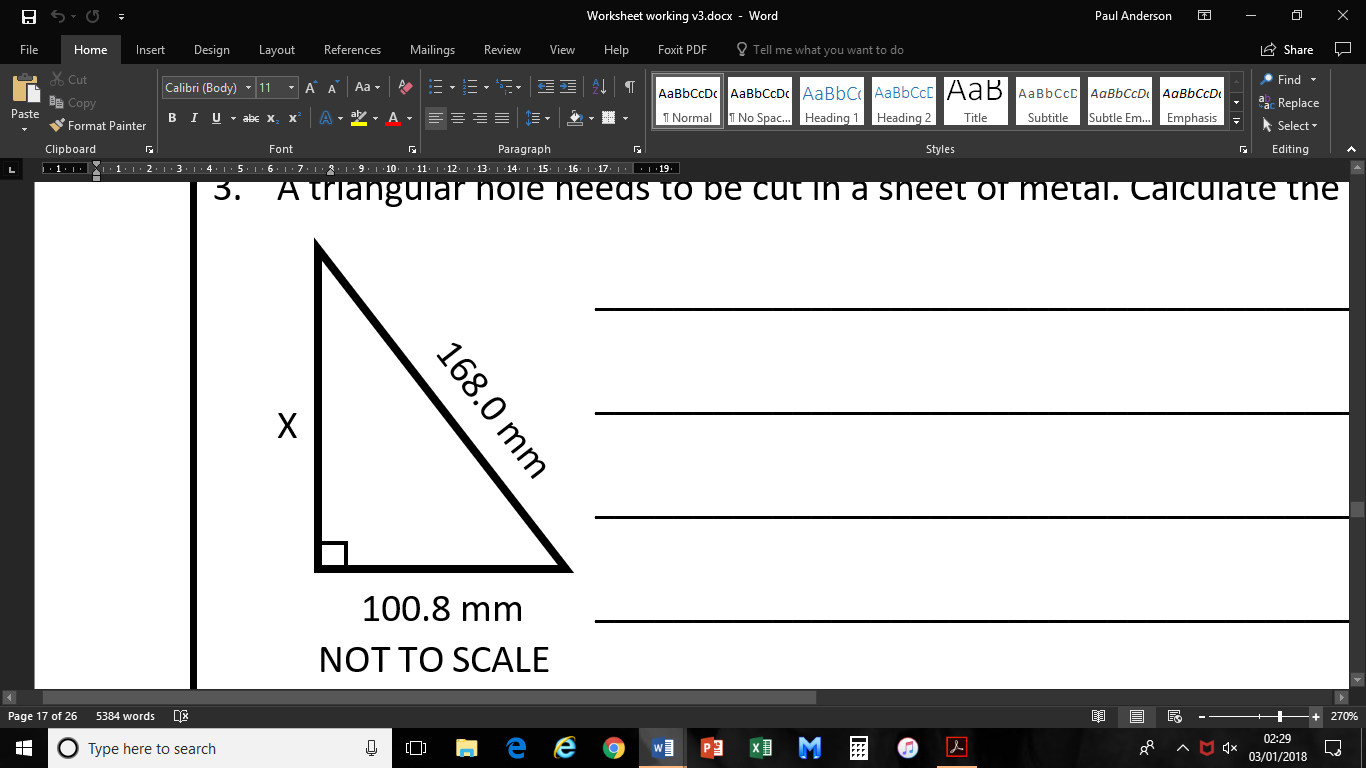
1.08 m

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1. A triangular hole needs to be cut in a sheet of metal. Calculate the length of side X to 1 decimal place.



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NOT TO SCALE

1. A triangular piece of material needs to be marked out for cutting. Calculate the lengths of sides A and B, which are known to be the same length.

A

1.982 m

B

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**Answers:**

**Skill Sheet: Pythagoras’ theorem**

1. C = √ (A2 + B2) = √ (6402 + 4802) = √ 640000 = 800 mm

2. X = √ (1.022 – 0.552) = √ 0.7379 = 0.86 m

**Practice Sheet: Pythagoras’ theorem**

1. Y = √ (952 + 242) = √ 9601 = 98 mm

2. A = √ (1.352 – 1.082) = √ 0.6561 = 0.81 m

3. X = √ (1682 – 100.82) = √ 18063.36 = 134.4 mm

4. As A = B, A = B = √ (1.982 / 2) = 1.4 m