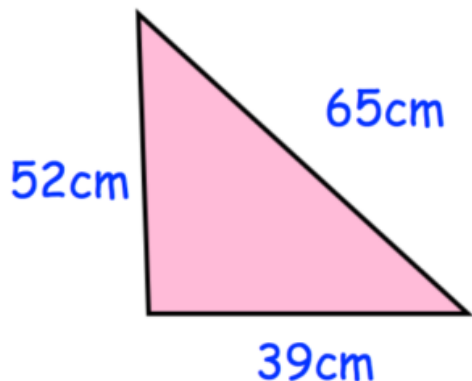
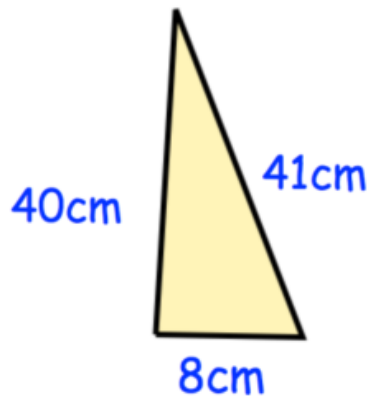


Pythagoras' Theorem 2D and 3D (recognise triples)

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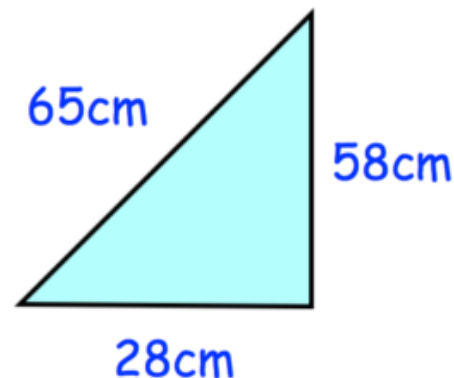
Worked example

The triangle has been drawn inaccurately. Is the triangle right-angled?



Your turn

The triangle has been drawn inaccurately. Is the triangle right-angled?



$$\begin{aligned}\text{No: } & \sqrt{28^2 + 58^2} \\ &= \sqrt{4148} \\ &= 64.4049 \dots \\ &\neq 65\end{aligned}$$

Worked example

Find the distance between the coordinates:

$(0, 0)$ and $(5, 7)$

$(-1, -4)$ and $(4, 3)$

Your turn

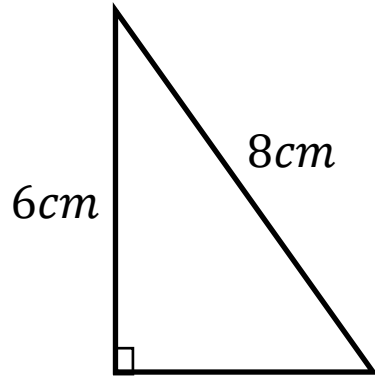
Find the distance between the coordinates:

$(-2, -3)$ and $(8, 11)$

17.20 (2 dp)

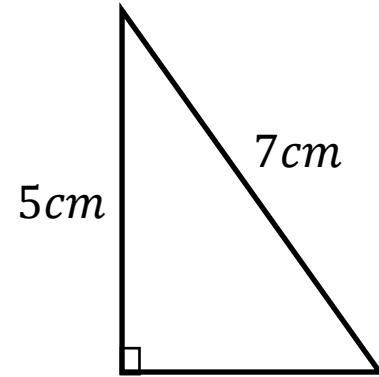
Worked example

Calculate the area of this triangle:



Your turn

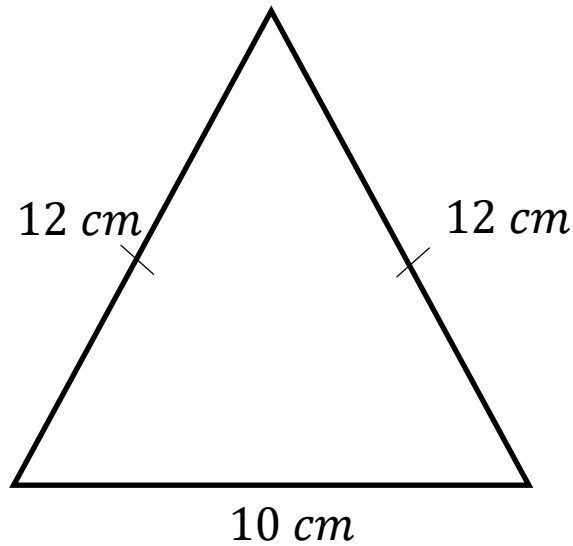
Calculate the area of this triangle:



12.25 cm^2 (2 dp)

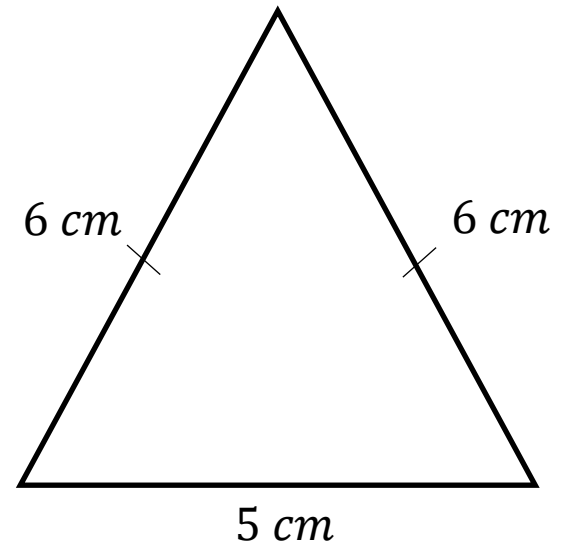
Worked example

Find the area of this triangle:



Your turn

Find the area of this triangle:



13.64 cm^2 (2 dp)

Worked example

A triangle has side lengths of 5 cm, 8 cm and 10 cm.

Is the triangle right-angled?

A triangle has side lengths of 6 cm, 8 cm and 10 cm.

Is the triangle right-angled?

Your turn

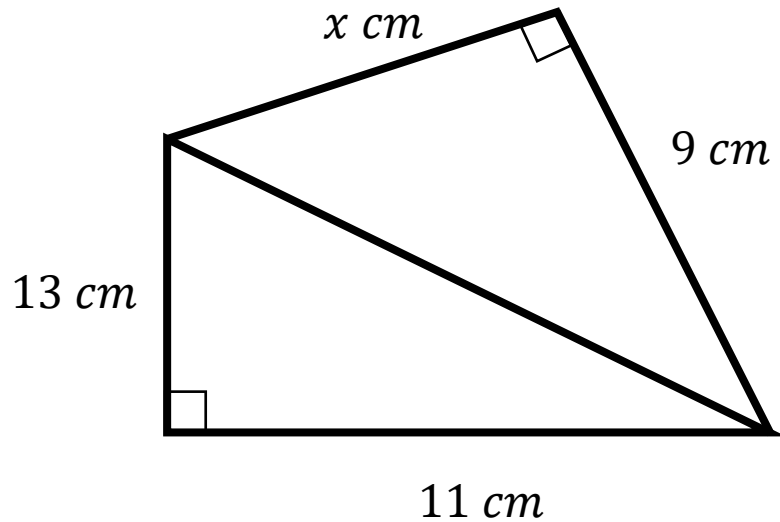
A triangle has side lengths of 10 cm, 16 cm and 20 cm.

Is the triangle right-angled?

No, $10^2 + 16^2 \neq 20^2$

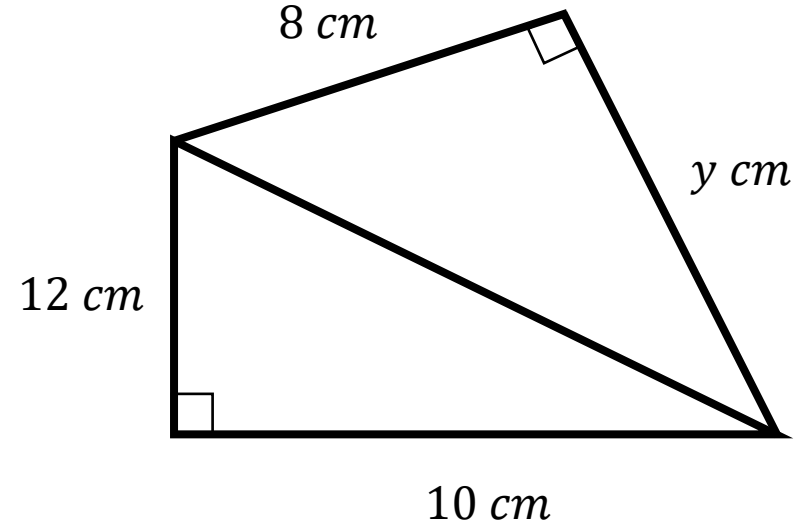
Worked example

Calculate x



Your turn

Calculate y



$$y = 13.42 \text{ (2 dp)}$$

Worked example

The lengths of a right-angled triangle are x , $x + 7$, $x + 8$. Find the area of the triangle

Your turn

The lengths of a right-angled triangle are x , $x + 3$, $x + 6$. Find the area of the triangle

24 square units

Worked example

The lengths of a right-angled triangle are x , $x + 7$, $x + 8$. Find the perimeter of the triangle

Your turn

The lengths of a right-angled triangle are x , $x + 1$, $x + 2$. Find the perimeter of the triangle

12 units

Worked example

Point A has coordinates $(2, 5)$.
Point B has coordinates $(x, 10)$.
Given that the distance AB is $\sqrt{34}$,
find the possible values of x

Your turn

Point A has coordinates $(5, 2)$.
Point B has coordinates $(x, 10)$.
Given that the distance AB is $\sqrt{65}$,
find the possible values of x

$$x = 4 \text{ or } 6$$

Worked example

Find the length of the longest diagonal in a cuboid measuring 6 by 8 by 10 cm

Your turn

Find the length of the longest diagonal in a cuboid measuring 3 by 4 by 5 cm

7.07 cm (2 dp)

Worked example

To generate a Pythagoras triple, choose any two positive integers, a and b .

- 1) Calculate the sum of their squares
- 2) Calculate the difference between their squares
- 3) Calculate double their product

You will have a Pythagoras Triple.
eg. if we start with 3 and 4

Your turn

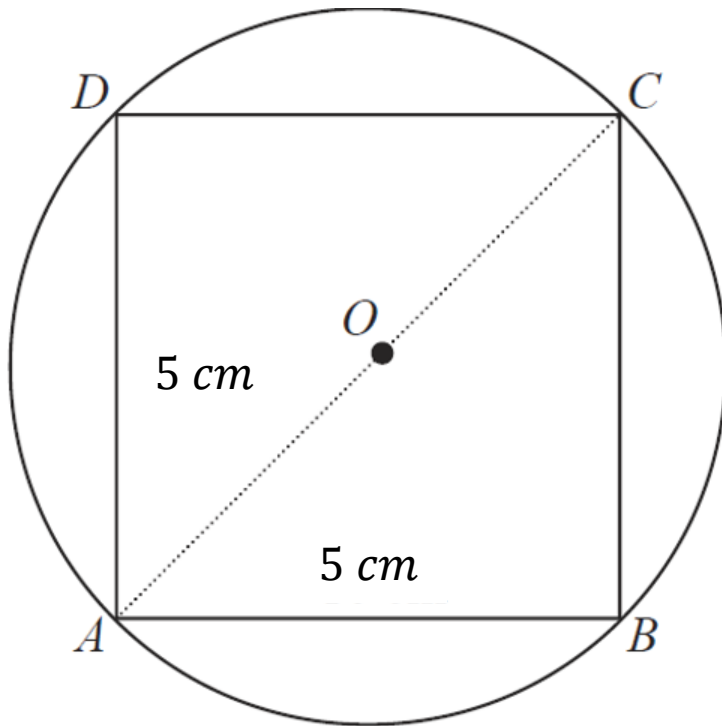
Using the method, find a Pythagoras triple starting with the numbers 2 and 5.

$$20^2 + 21^2 = 29^2$$

Can you prove why it works algebraically?

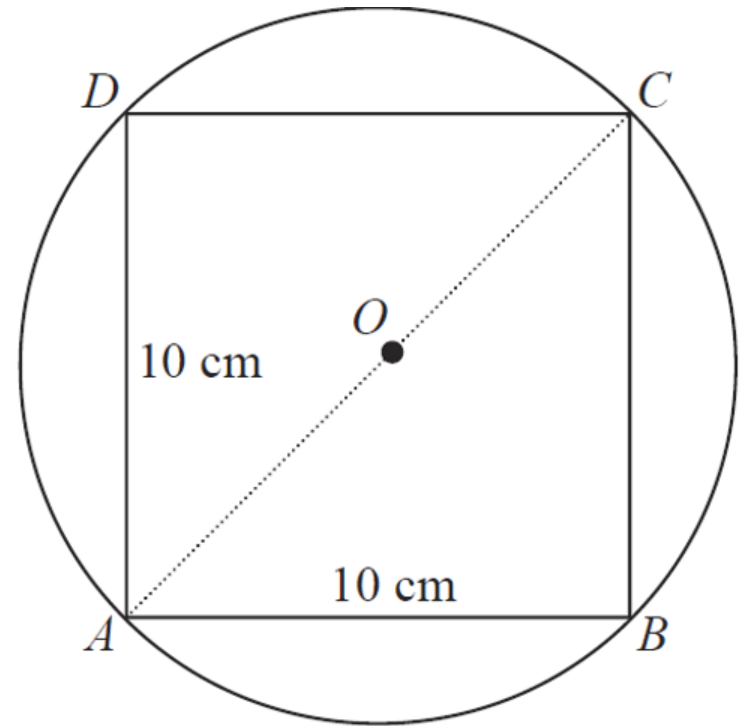
Worked example

Calculate the area of the circle



Your turn

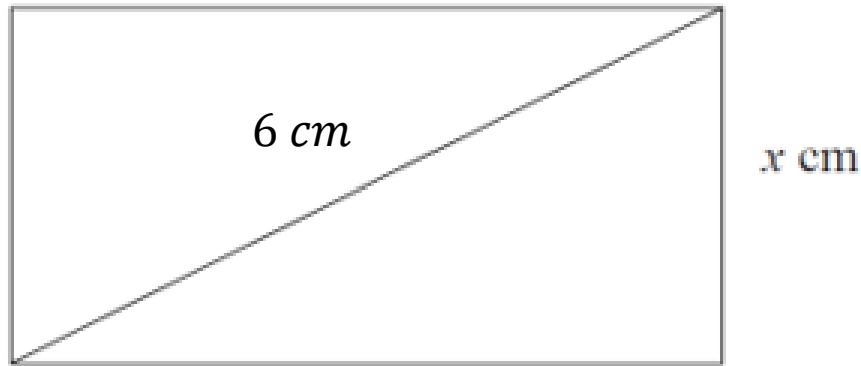
Calculate the area of the circle



44.4 cm^2 (1 dp)

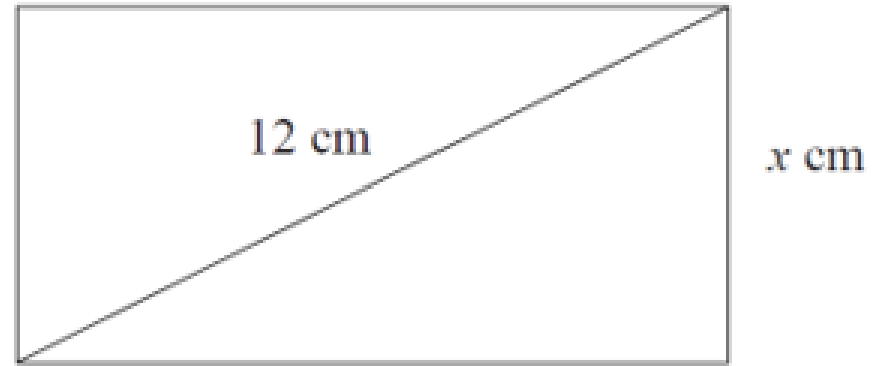
Worked example

The perimeter of the rectangle is 14 cm . Work out the possible values of x



Your turn

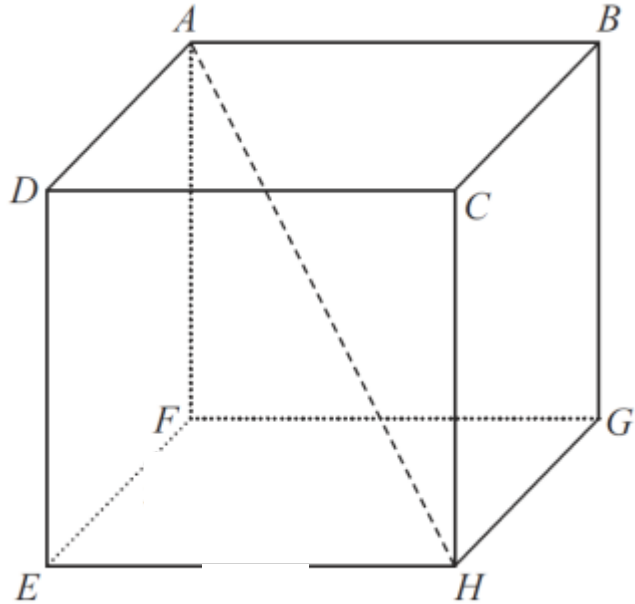
The perimeter of the rectangle is 28 cm . Work out the possible values of x



$$x = 11.8 \text{ or } 2.2 \text{ (1 dp)}$$

Worked example

A cube ABCDEFGH has side lengths of 10 cm.
Find the angle between the diagonal AH and the base EFGH



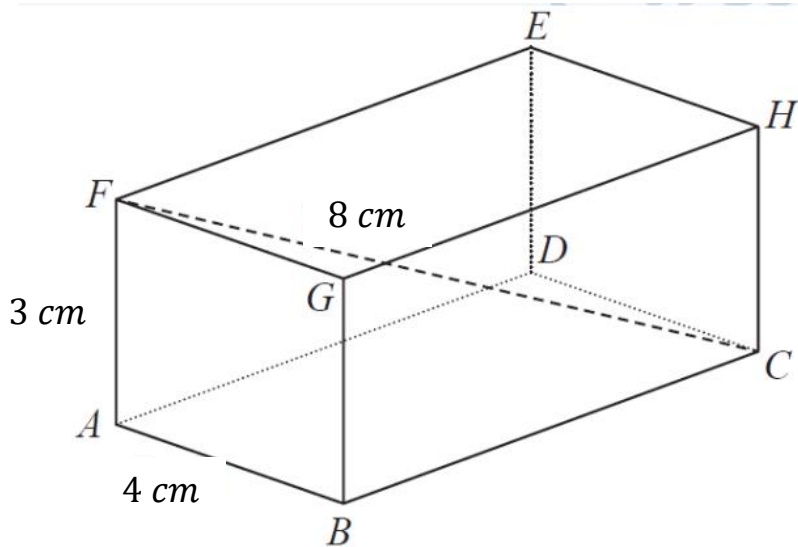
Your turn

A cube ABCDEFGH has side lengths of 5 cm.
Find the angle between the diagonal AH and the base EFGH

35.26° (2 dp)

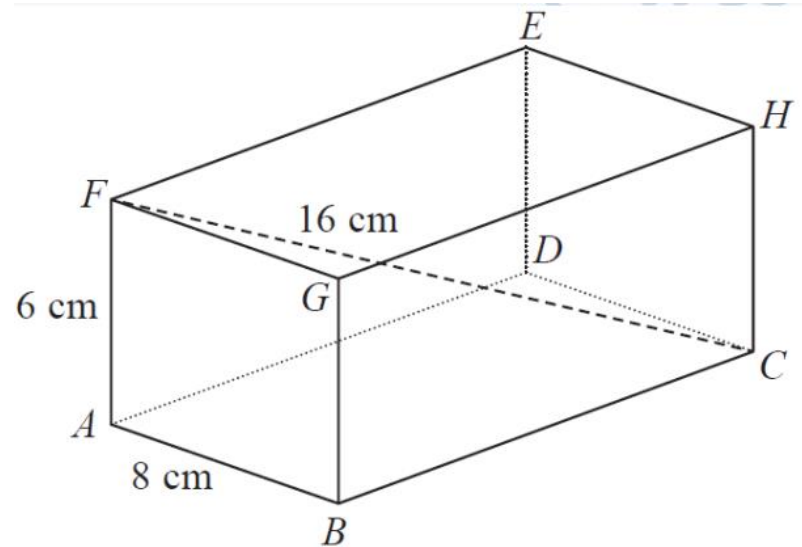
Worked example

Calculate the angle between the line FC and the plane $ABGF$



Your turn

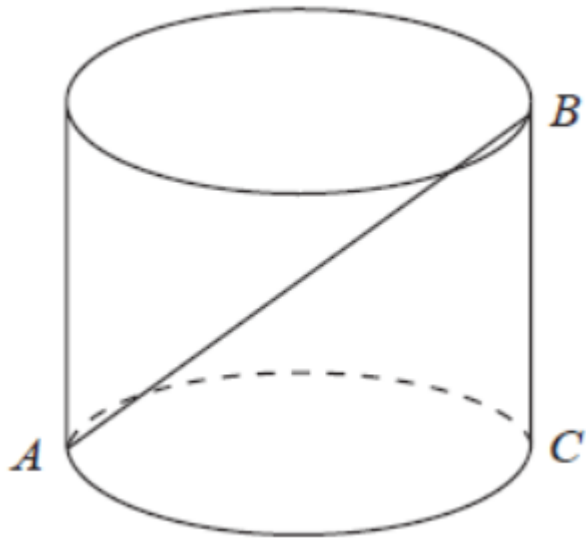
Calculate the angle between the line FC and the plane $ABGF$



51.32° (2 dp)

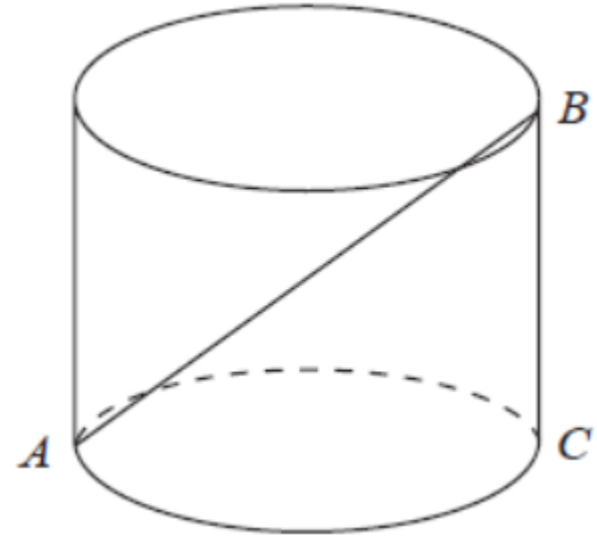
Worked example

There is a rod in a cylindrical tin.
AC is a diameter of the base.
BC is vertical.
The radius of the base is 2.5 cm .
The volume of the tin is 589 cm^3 .
Find the angle between the rod and the base of the tin.



Your turn

There is a rod in a cylindrical tin.
AC is a diameter of the base.
BC is vertical.
The radius of the base is 2.5 cm .
The volume of the tin is 589 cm^3 .
Find the angle between the rod and the base of the tin.



56°