

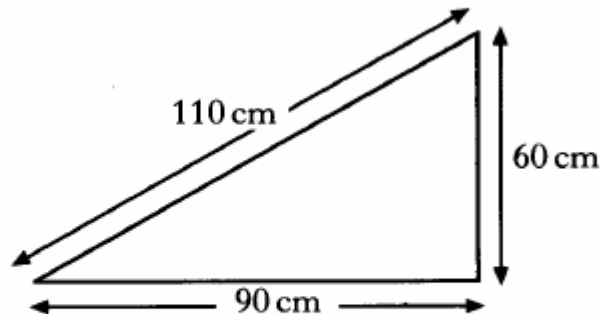
National 5 Pythagoras Problems

Solutions can be found from the school maths website

(<http://www.dunblanehighschool.org.uk/maths/course/national-5/nat-5-past-papers/>)

1.
05
P2

A triangular paving slab has measurements as shown.

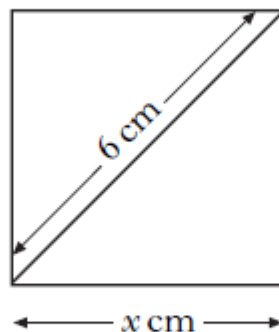


Is the slab in the shape of a right angled triangle?

Show your working.

2.
07
P1

A square of side x centimetres has a diagonal 6 centimetres long.

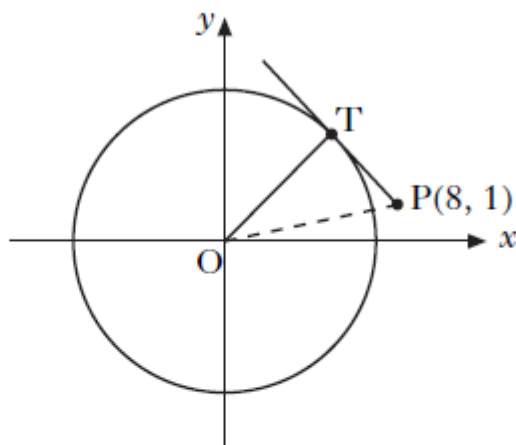


Calculate the value of x , giving your answer as a surd in its simplest form.

3.
08
P2

A circle, centre the origin, is shown.

P is the point (8, 1).



(a) Calculate the length of OP.

The diagram also shows a tangent from P which touches the circle at T.

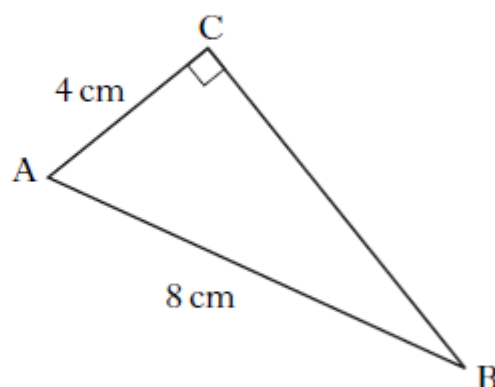
The radius of the circle is 5 units.

(b) Calculate the length of PT.

4.
09
P1

In triangle ABC:

- angle $ACB = 90^\circ$
- $AB = 8$ centimetres
- $AC = 4$ centimetres.

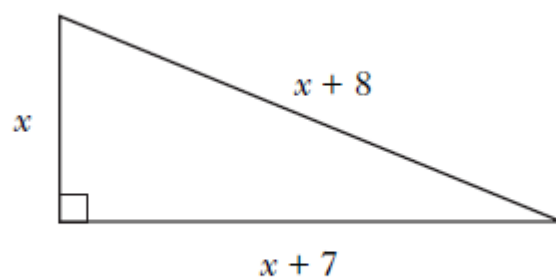


Calculate the length of BC.

Give your answer as a surd in its simplest form.

5.
10
P2

A right-angled triangle has dimensions, in centimetres, as shown.

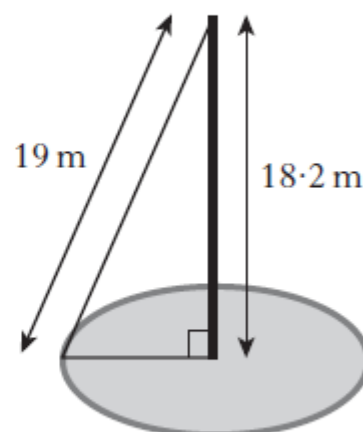


Calculate the value of x .

6.
13
P2

A mobile phone mast, 18.2 metres high, stands vertically in the centre of a circle.

It is supported by a wire rope, 19 metres long, attached to the ground at a point on the circumference of the circle, as shown.



Calculate the circumference of the circle.

7.
14
P2

The diagram below shows the position of three towns.

Lowtown is due west of Midtown.

The distance from

- Lowtown to Midtown is 75 kilometres.
- Midtown to Hightown is 110 kilometres.
- Hightown to Lowtown is 85 kilometres.



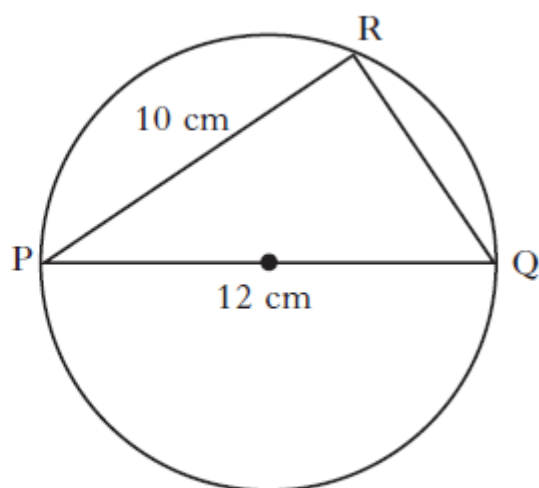
Is Hightown directly north of Lowtown?

Justify your answer.

8.
12
P1

In the diagram,

- PQ is the diameter of the circle
- $PQ = 12$ centimetres
- $PR = 10$ centimetres.

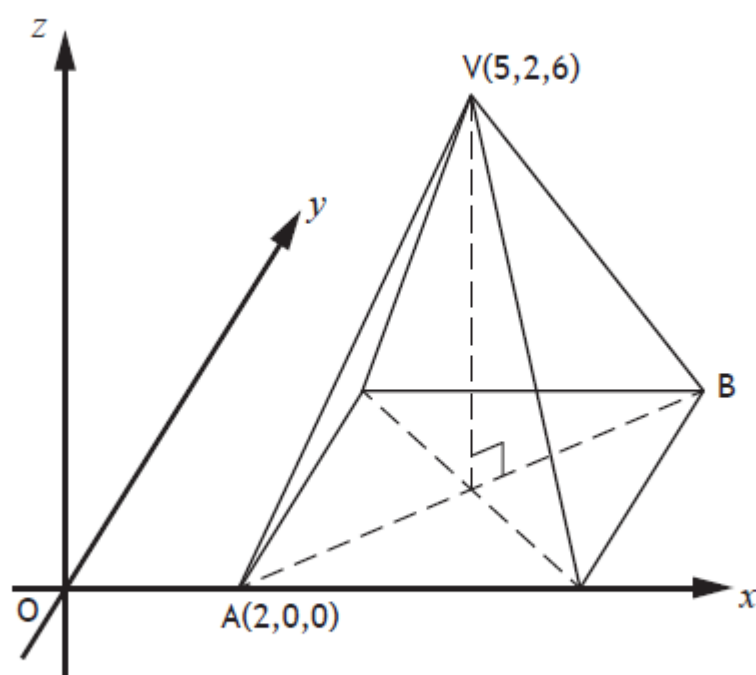


Calculate the length of QR.

Give your answer as a surd in its simplest form.

9.
16
P1

The diagram shows a rectangular based pyramid, relative to the coordinate axes.

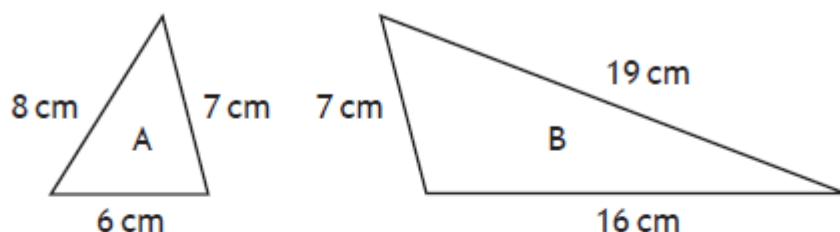


- A is the point $(2,0,0)$.
- V is the point $(5,2,6)$.

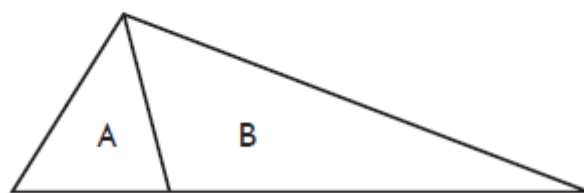
Calculate the length of edge AV of the pyramid.

10.
17
P2

Triangles A and B are shown below.



The triangles are placed together to form the larger triangle shown below.



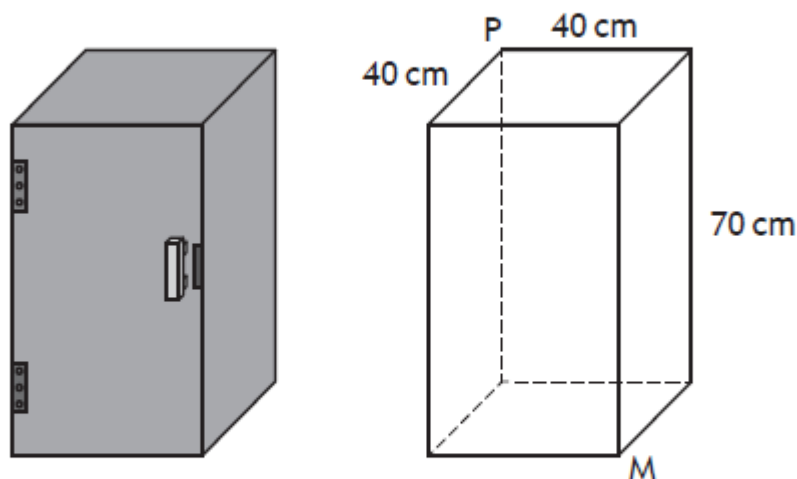
Is this larger triangle right-angled?

Justify your answer.

11.
18
P2

Chris wants to store his umbrella in a locker.

The locker is a cuboid with internal dimensions of length 40 centimetres, breadth 40 centimetres and height 70 centimetres.



The umbrella is 85 centimetres long.

He thinks it will fit into the locker from corner P to corner M.

Is he correct?

Justify your answer.

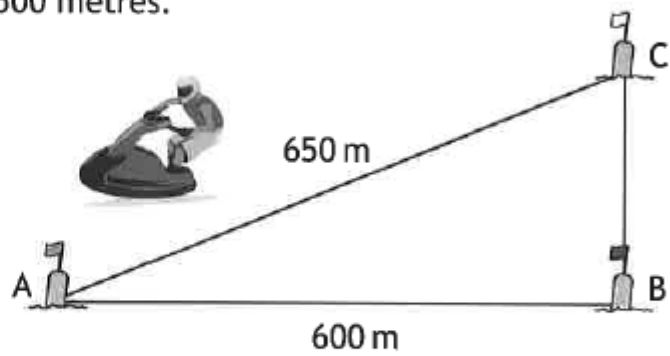
12.
19
P2

The diagram shows the course for a jet-ski race.

The course is indicated by markers A, B and C.

The total length of the course is 1500 metres.

- B is 600 metres from A
- C is 650 metres from A
- C is due north of B



Determine whether B is due east of A.

Justify your answer.