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National 5 Maths Converse of Pythagoras

SQA past paper and specimen paper questions and answers by topic

BE GREEN
KEEP IT ON
THE SCREEN

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.

Hightown

85 km   110 km

Lowtown   75 km   Midtown

Is Hightown directly north of Lowtown?

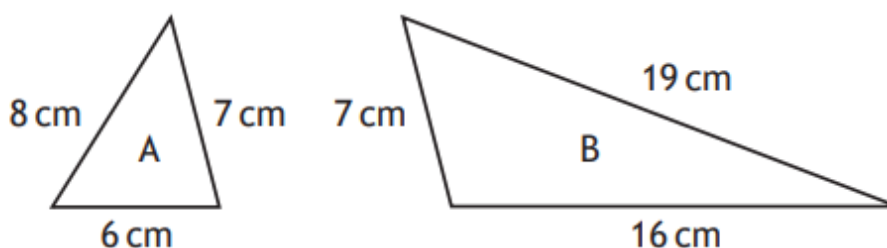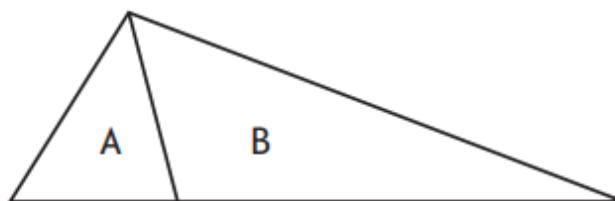**Justify your answer.**   4

Answer:

$85^2 + 75^2 \neq 110^2$ so by the Converse of Pythagoras, the triangle is not right-angled.
Hightown is not therefore directly north of Lowtown.

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?   **3**

Justify your answer.

Answer:

$8^2 + 19^2 \neq 22^2$ so by the Converse of Pythagoras, the larger triangle is not right-angled.
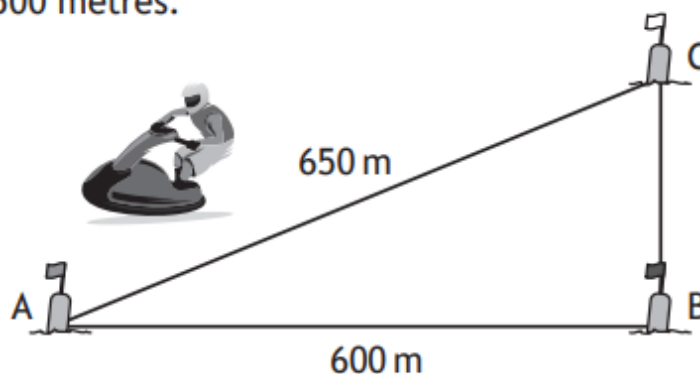
The diagram shows the course for a jet-ski race.

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
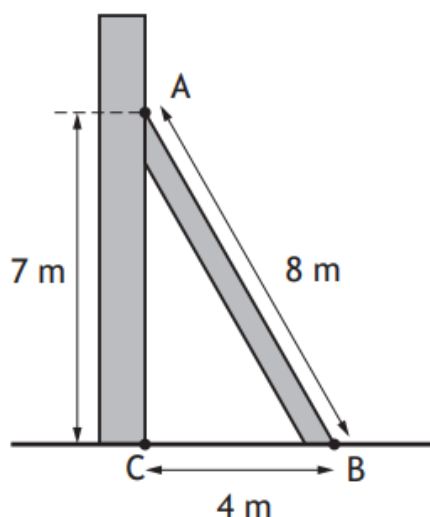- C is due north of B

Determine whether B is due east of A.

Justify your answer.   4

Answer:

$250^2 + 600^2 = 650^2$, so by the Converse of Pythagoras' Theorem, B is due east of A.

A wooden beam is used to support a wall built on horizontal ground as shown in the diagram.

The edge of the beam, AB, is 8 metres long.

C is at the foot of the wall.

A is 7 metres from C.

B is 4 metres from C.

Determine whether the wall is perpendicular to the ground.

Justify your answer. 4

Answer:

$4^2 + 7^2 \neq 8^2$, so by the Converse of Pythagoras' Theorem, the angle is not right-angled, so the wall is not perpendicular to the ground.

Note:

It is also possible to answer this question using the cosine rule.