Pythagoras' Theorem – Teacher notes

Activity description

Students use Pythagoras' Theorem to solve problems.

Suitability

Level 2 (Intermediate/Higher)

Time

1–2 hours

Resources and equipment

Student information sheets, slideshow, calculators.

Key mathematical language

Right-angled triangle, hypotenuse, square root, trapezium.

Notes on the activity

The questions in this activity are all set in context. Before attempting them students are likely to need practice in using Pythagoras' Theorem in simple right-angled triangles.

The accompanying slideshow includes both the examples. It is intended as an aid to recapping/revising Pythagoras' Theorem before using it in problem-solving, rather than as an initial introduction.

There are many websites to help with the initial introduction of Pythagoras' Theorem and provide more straightforward worksheets. See the list at the end of these notes.

During the activity

Students who struggle should be encouraged to redraw the diagrams for themselves, identifying right-angled triangles and their hypotenuses.

Points for discussion

Ensure students realise that they should *add* to find the hypotenuse and *subtract* to find either of the shorter sides.

Discuss the value of students drawing their own diagrams. Stress the importance of writing all the known values on the diagram – this can often help students to see how to proceed.

The slideshow includes discussion points and questions to help students reflect on their work.

Extensions

Question 6 on the student sheet is quite challenging. Able students could omit the first few questions in order to have time to attempt it.

Answers

1 36 m (nearest m)

2 2.3 m (1 dp)

3 31 m (nearest m)

4 1.95 m (2 dp)

5 6.65 m (2 dp)

6a 27 cm (nearest cm) **b** 1.42 m^2 (2 dp)

Useful websites

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Proofs of Pythagoras

http://www.cut-the-knot.org/pythagoras/index.shtml (96 proofs!)

Pictures and information about Pythagoras

http://www-groups.dcs.st-and.ac.uk/~history/Mathematicians/Pythagoras.html

Worksheets

http://assets.cambridge.org/052189/0268/sample/0521890268ws.pdf (Colourful chapter from SMP Interact)

http://www.cimt.plymouth.ac.uk/projects/mepres/book9/bk9i15/bk9_15i1.html (Chapter from the Mathematics Enhancement Programme)

http://www.funmaths.com/worksheets/downloads/view.htm?ws0055_1.gif (Finding sides)

http://www.funmaths.com/worksheets/downloads/view.htm?ws0055_2.gif (Answers to above)

http://www.math.clemson.edu/~rsimms/neat/math/pyth (Pythagorean Triples)