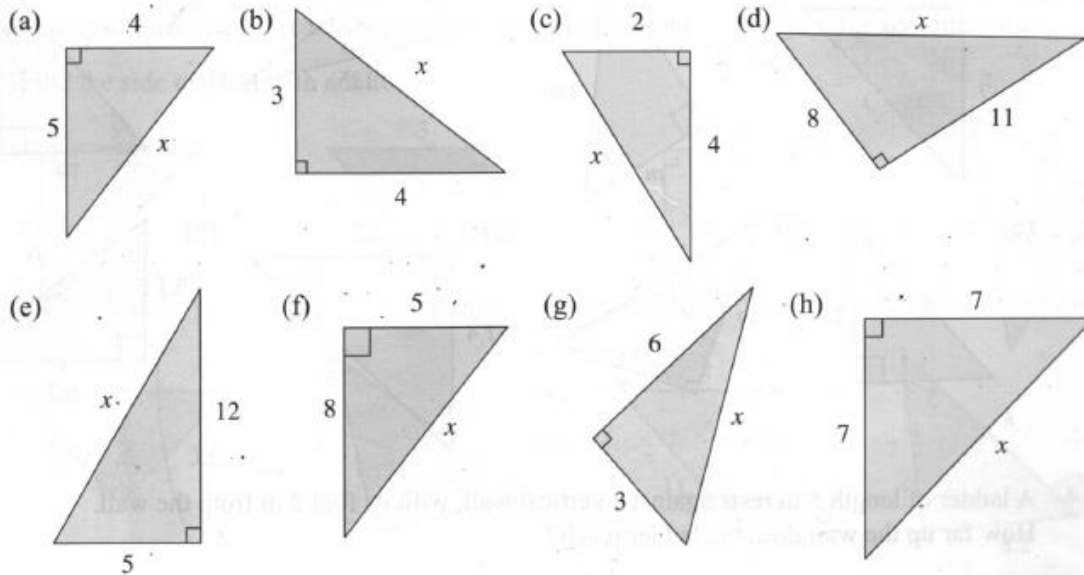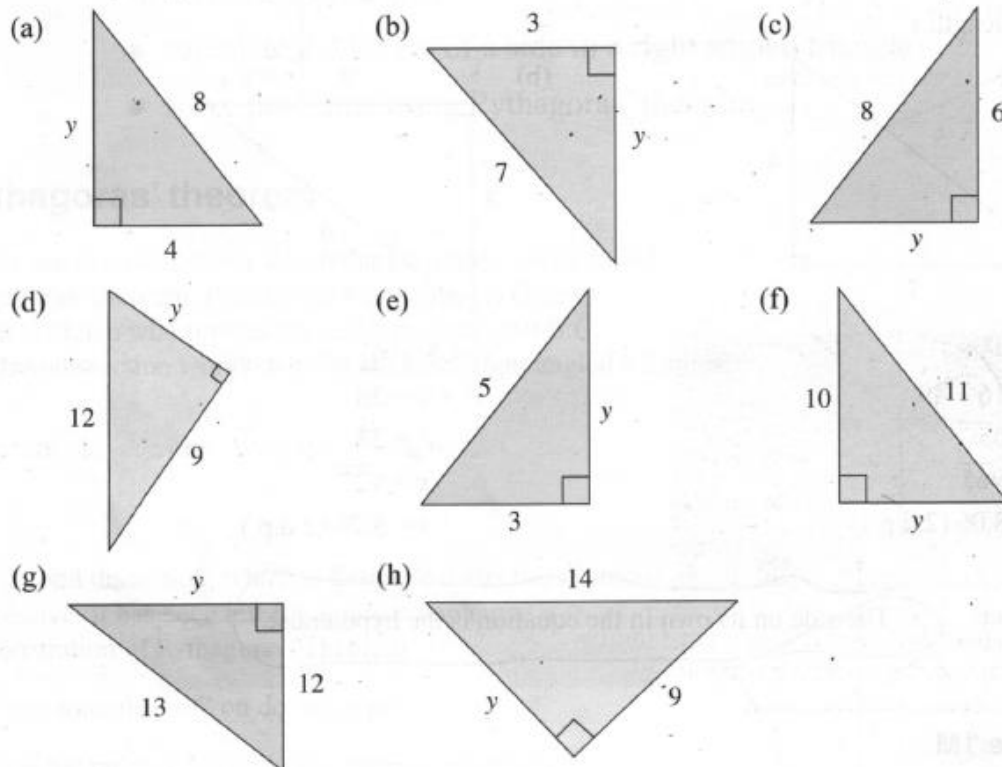# Pythagoras Theorem

Exercise A

Give your answers correct to 2 d.p. where necessary. The units are cm unless you are told otherwise.

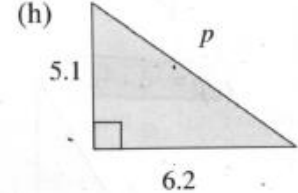1   Find x.
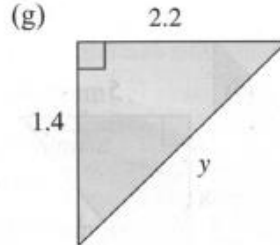
(a)
(b)
(c)
(d)

(e)
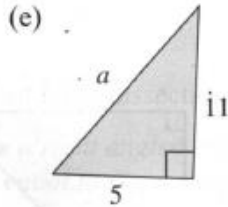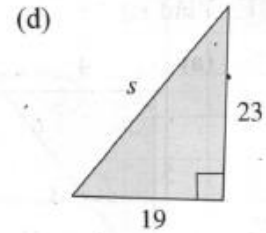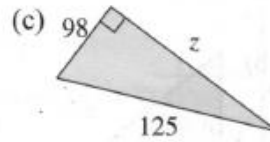(f)
(g)
(h)

2   Find y.

Hint: In part (a) write $y^2 + 4^2 = 8^2$

(a)
(b)
(c)

(d)
(e)
(f)

(g)
(h)

3 Find the side marked with a letter. It may be the hypotenuse or one of the other sides.

(a)

4.5

7

t

(b)

1.8

3.6

m

(c)

98

z

125

(d)

s

23

19

(e)

a

11

5

(f)

9

7

x

(g)

2.2

1.4

y

(h)

5.1

p

6.2
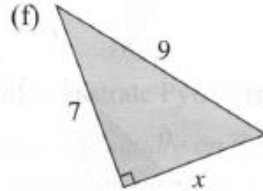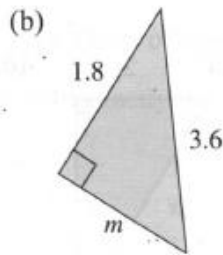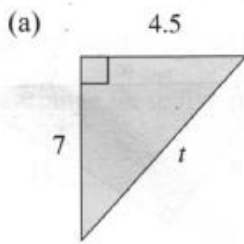
4 A ladder of length 5 m rests against a vertical wall, with its foot 2 m from the wall. How far up the wall does the ladder reach?

5 A ladder of length 4 m reaches 32 m up a vertical wall. How far is the foot of the ladder from the wall?

6 A boat sails from the harbour to the lighthouse. The lighthouse is 11 km to the south and 8 km to the east of the harbour. Calculate the distance between the harbour and the light house.

North

Harbour

Lighthouse

Sea

Land

7
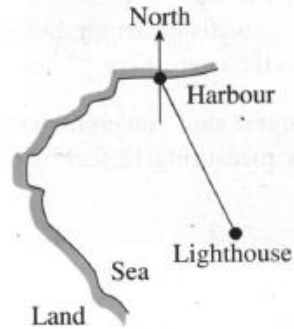
Each of the small squares on a chess board has an area of 16 cm².

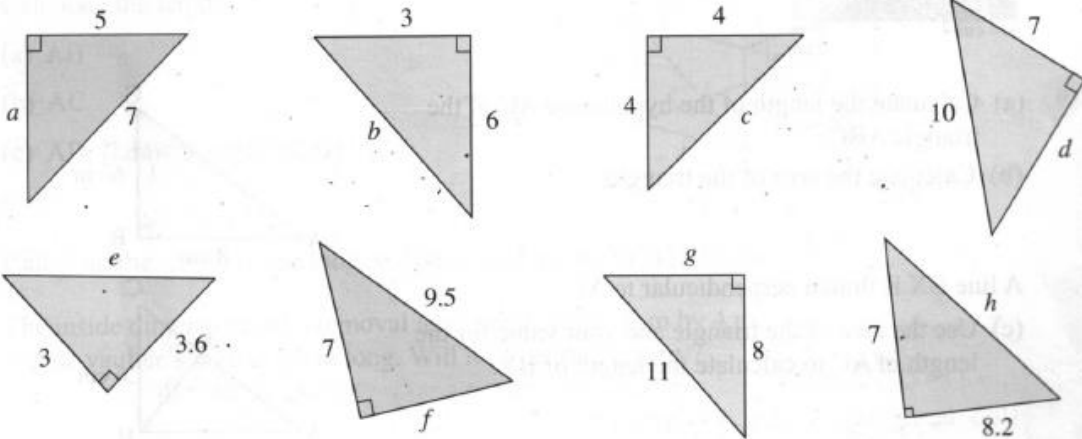Calculate the length of a diagonal drawn across the whole board.

8 The square and the rectangle have the same perimeter. Which has the longer diagonal and by how much?

5 cm

5 cm

3 cm

7 cm
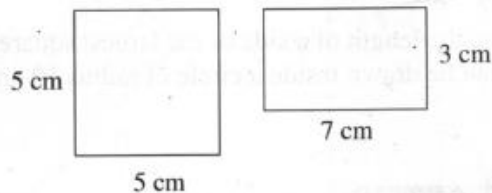
Exercise B

Give answers correct to 2 d.p. where necessary. The units are cm unless you are told otherwise.

1 Find the side marked with a letter

2 A ship sails 40 km due south and then a further 65 km due east. How far is the ship from its starting point?

3 A square has diagonals of length 24 cm. Find the length of a side of the square to the nearest cm.

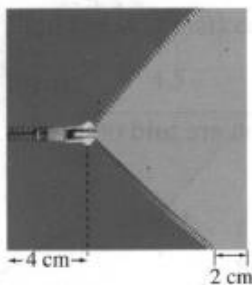4 What is the longest shot you could have to play on a snooker table measuring 12 feet by 6 feet?

5 Calculate the height of the isosceles triangle shown.

9 cm h 9 cm

6 cm
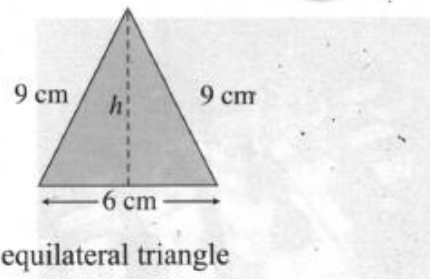
6 Calculate the vertical height and hence the area of an equilateral triangle of side 14 cm.

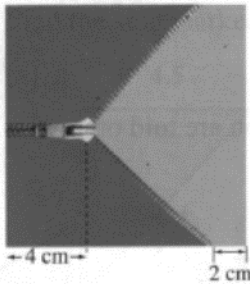7 Calculate the length of a side of the largest square which can be drawn inside a circle of radius 10 cm.
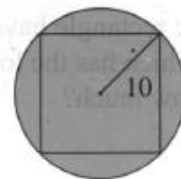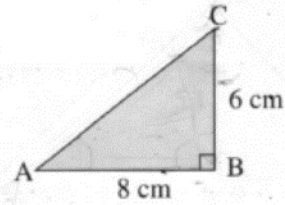
10

8 A zip is shown inside a square of side 11 cm. Calculate the length of sloping parts of the zip.
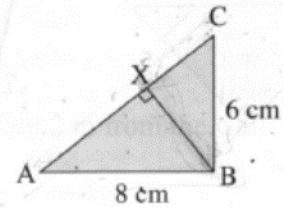
4 cm

2 cm

8

A zip is shown inside a square of side 11 cm.
Calculate the length of sloping parts of the zip.

←4 cm→
2 cm

9 (a) Calculate the length of the hypotenuse AC of the
    triangle ABC.
    (b) Calculate the area of the triangle.

C
6 cm
A
8 cm
B

A line BX is drawn perpendicular to AC.

(c) Use the area of the triangle and your value for the
    length of AC to calculate the length of BX.

C
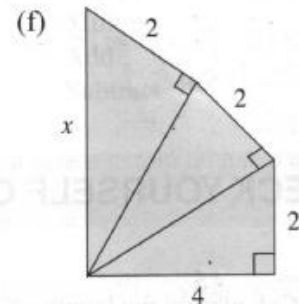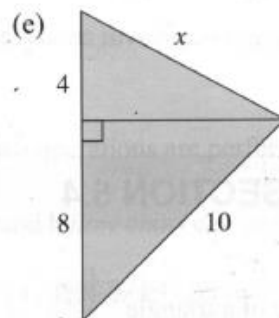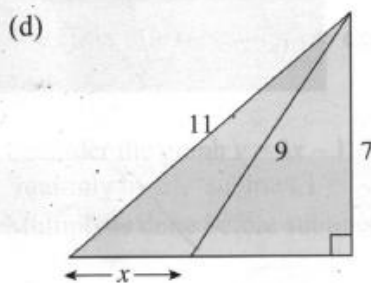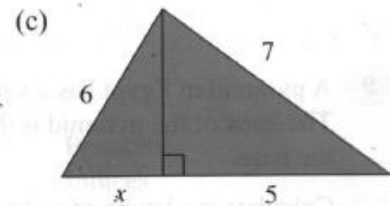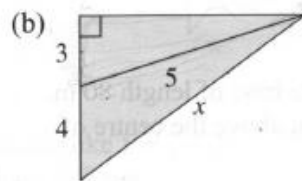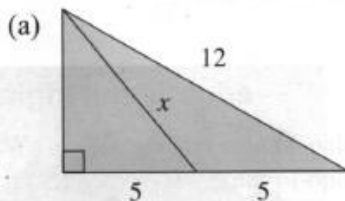X
6 cm
A
8 cm
B

Exercise C

1 A square field has an area of 4 hectares.
   Calculate the length of the diagonals of the field.

2 Find the length x. All lengths are in cm.

(a)

12
x
5   5

(b)

3
5
4   x

(c)

7
6
x   5

(d)

11
9   7
←x→

(e)

x
4
8   10

(f)

2
2
x
2
4

3   The diagonal of a square has length 5 cm. What is the area of the square (in cm²)?
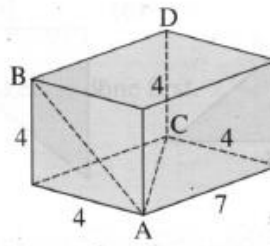
4   The diagram shows a rectangular box (a cuboid).

Calculate the length of

(a) AB

(b) AC

(c) AD. [Draw triangle ACD].

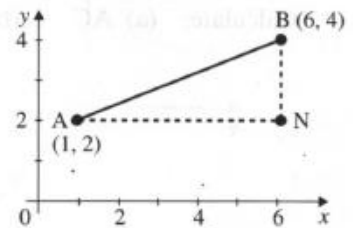5   Calculate the length of the longest diagonal of a cube of side 10 cm.

6   The inside dimensions of a removal lorry are 2.5 m by 3 m by 4 m.
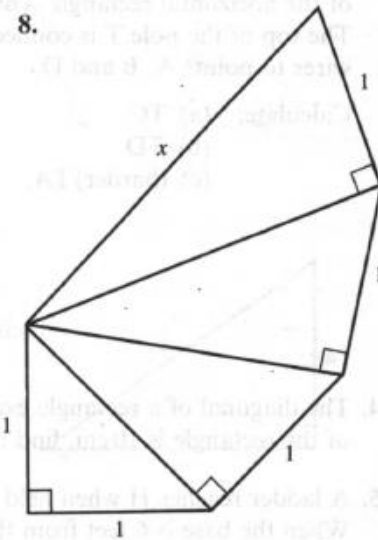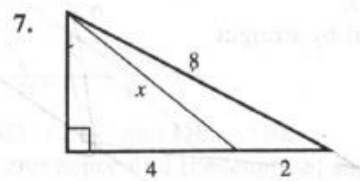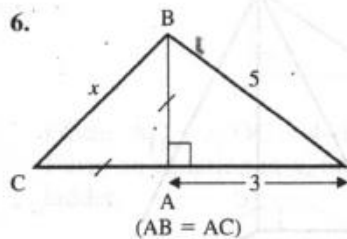A pole vaulter's pole is 5.7 m long. Will it fit inside the lorry?
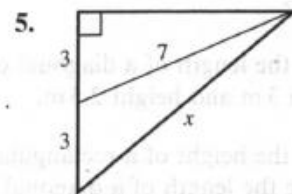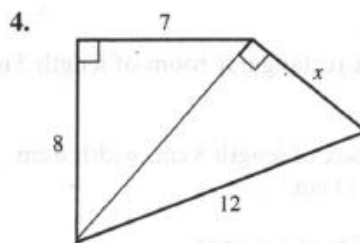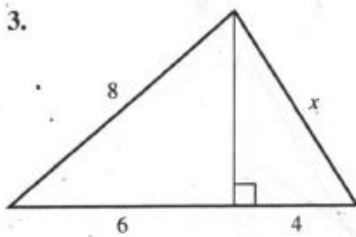

Exercise D

1. In the diagram A is (1, 2) and B is (6, 4).
Work out the length AB. (First find the length of AN and BN).

2. On squared paper plot P(1, 3), Q(6, 0), R(6, 6). Find the lengths of
the sides of triangle PQR. Is the triangle isosceles?

In Questions **3** to **8** find x.

3.

4.

5.

6.

7.

8.

9. The diagram shows a rectangular block.
Calculate: (a) AC (b) AY.