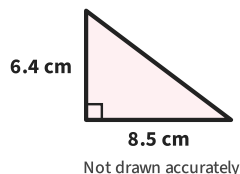


1 Finding the hypotenuse

- a) Find the perimeter of this triangle to 1 decimal place.
- b) A triangle has sides of 20 cm, 21 cm and 29 cm. Show that it has a right angle.



$$a) \sqrt{6.4^2 + 8.5^2} = \sqrt{113.21} = 10.64$$

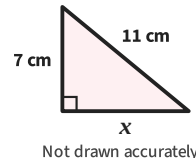
$$6.4 + 8.5 + 10.64 = 25.5 \text{ cm}$$

$$b) 20^2 + 21^2 = 400 + 441 = 841 = 29^2$$

2 Finding a shorter side

Give each answer to 1 decimal place.

- a) Ali writes $x = \sqrt{11^2 + 7^2} = 13.0$ cm. Explain his mistake and find x .
- b) A rectangle has a diagonal of 15.2 cm and a width of 6.8 cm. Find its area.



$$a) 11 \text{ is the hypotenuse: } \sqrt{11^2 - 7^2} = 8.5 \text{ cm}$$

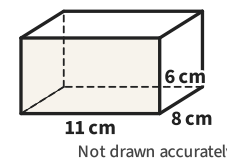
$$b) \sqrt{15.2^2 - 6.8^2} = 13.59$$

$$13.59 \times 6.8 = 92.4 \text{ cm}^2$$

3 Pythagoras in 3D

A box is a cuboid.

- a) Find the diagonal of its base to 1 decimal place.
- b) Will a 15 cm pencil fit in the box? Show how you decide.



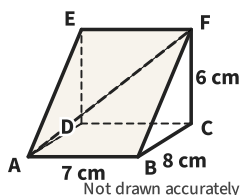
$$a) \sqrt{11^2 + 8^2} = \sqrt{185} = 13.6 \text{ cm}$$

$$b) \sqrt{185 + 6^2} = \sqrt{221} = 14.9 \text{ cm, so no}$$

4 Pythagoras in 3D

ABCDEF is a wedge. ABCD is a horizontal rectangle and DCFE is a vertical rectangle.

- a) Find the length AE.
- b) Find the length AF to 1 decimal place.



$$a) AE = \sqrt{8^2 + 6^2} = \sqrt{100} = 10 \text{ cm}$$

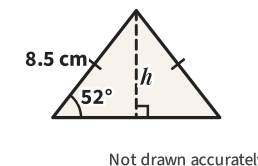
$$b) AF = \sqrt{10^2 + 7^2} = \sqrt{149} = 12.2 \text{ cm}$$

Pythagoras' theorem and trigonometry revision mat answers

5 Trigonometry: finding a side

Give each answer to 1 decimal place.

- a) Find the height h of this isosceles triangle.
- b) Find the length of its base.



$$a) h = 8.5 \sin 52^\circ = 6.7 \text{ cm}$$

$$\text{half the base} = 8.5 \cos 52^\circ = 5.23$$

$$b) 2 \times 5.233 = 10.5 \text{ cm}$$

6 Trigonometry: finding a side

A zip wire runs in a straight line from the top of a tower 14 m high down to level ground. It meets the ground at an angle of 18° . Give each answer to 1 decimal place.

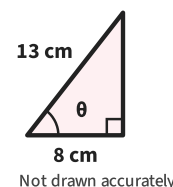
- a) How long is the zip wire?
- b) How far from the foot of the tower does it reach the ground?

$$a) \sin 18^\circ = \frac{14}{w}, w = 14 \div \sin 18^\circ = 45.3 \text{ m}$$

$$b) 14 \div \tan 18^\circ = 43.1 \text{ m}$$

7 Trigonometry: finding an angle

- a) Find the angle θ to 1 decimal place.
- b) Sam types $\tan^{-1}(8 \div 13)$ to find θ . Explain Sam's mistake.



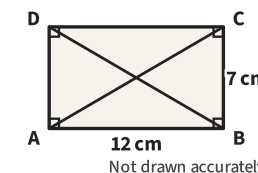
$$a) \cos \theta = \frac{8}{13}, \theta = 52.0^\circ$$

$$b) 13 \text{ cm is the hypotenuse, not the opposite side, so it is cos, not tan}$$

8 Trigonometry: finding an angle

ABCD is a rectangle. Give each answer to 1 decimal place.

- a) Find the angle CAB.
- b) Find the acute angle between the diagonals AC and BD.



$$a) \tan^{-1}(7 \div 12) = 30.26^\circ, \text{ so } 30.3^\circ$$

the diagonals cut each other in half:
isosceles triangles

$$b) 2 \times 30.26 = 60.5^\circ$$