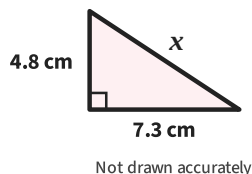


1 Finding the hypotenuse

- a) Find the length x to 1 decimal place.
- b) P is the point $(-3, 5)$ and Q is the point $(4, -1)$. Find the length PQ to 1 decimal place.

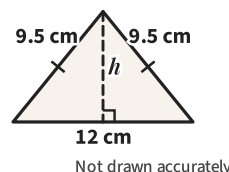


$$a) \sqrt{4.8^2 + 7.3^2} = \sqrt{76.33} = 8.7 \text{ cm}$$

$$b) \sqrt{7^2 + 6^2} = \sqrt{85} = 9.2$$

2 Finding a shorter side

- a) Find the height h of this isosceles triangle to 1 decimal place.
- b) Find the area of the triangle.



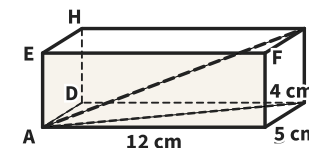
$$a) h = \sqrt{9.5^2 - 6^2} = \sqrt{54.25} = 7.4 \text{ cm}$$

$$b) \frac{1}{2} \times 12 \times 7.365... = 44.2 \text{ cm}^2$$

3 Pythagoras in 3D

The diagram shows a cuboid. It is not drawn accurately.

- a) Find the length of the diagonal AC.
- b) Find the length AG to 1 decimal place.



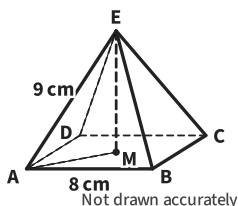
$$a) AC = \sqrt{12^2 + 5^2} = \sqrt{169} = 13 \text{ cm}$$

$$b) AG = \sqrt{13^2 + 4^2} = \sqrt{185} = 13.6 \text{ cm}$$

4 Pythagoras in 3D

ABCDE is a pyramid on a square base. E is directly above M, the centre of the base. Each sloping edge is 9 cm.

- a) Find AM to 2 decimal places.
- b) Find the height EM.



$$a) AC = \sqrt{8^2 + 8^2} = \sqrt{128}, AM = 5.66 \text{ cm}$$

$$b) EM = \sqrt{9^2 - 32} = \sqrt{49} = 7 \text{ cm}$$

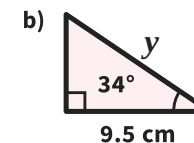
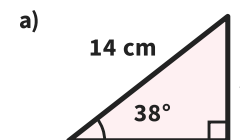
Pythagoras' theorem and trigonometry

revision mat answers

Higher A

5 Trigonometry: finding a side

Find the lengths x and y . Give each answer to 1 decimal place.



$$a) x = 14 \sin 38^\circ = 8.6 \text{ cm}$$

$$b) y = 9.5 \div \cos 34^\circ = 11.5 \text{ cm}$$

6 Trigonometry: finding a side

From the top of a cliff 45 m high, the angle of depression of a kayak on the sea is 19° .

- a) How far is the kayak from the foot of the cliff?
- b) The kayak paddles straight towards the cliff. The angle of depression is now 37° . How far has it moved?

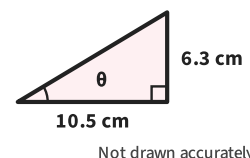
$$a) \tan 19^\circ = 45 \div d, d = 130.7 \text{ m}$$

$$45 \div \tan 37^\circ = 59.72 \text{ m}$$

$$b) 130.69 - 59.72 = 71.0 \text{ m}$$

7 Trigonometry: finding an angle

- a) Find the angle θ to 1 decimal place.
- b) A ramp is 4.2 m long along its slope and rises 0.35 m. A ramp is safe for wheelchairs if it slopes at less than 5° . Is this ramp safe?



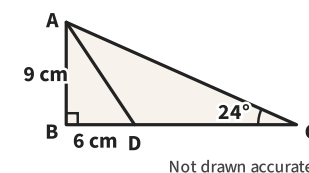
$$a) \theta = \tan^{-1}(6.3 \div 10.5) = 31.0^\circ$$

$$b) \sin^{-1}(0.35 \div 4.2) = 4.8^\circ, \text{ less than } 5^\circ, \text{ so yes}$$

8 Trigonometry: finding an angle

Give each answer to 1 decimal place.

- a) Find the angle ADB.
- b) Find the length DC.



$$a) \tan^{-1}(9 \div 6) = 56.3^\circ$$

$$BC = 9 \div \tan 24^\circ = 20.21 \text{ cm}$$

$$b) DC = 20.21 - 6 = 14.2 \text{ cm}$$