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Higher GCSE Revision

Exam Style Questions

Topics covered in this video...

- 👉 Pythagoras' Theorem
- 👉 Right-Angled Trigonometry
- 👉 Pythagoras' Theorem in 3D

See the description below for links to the files used in this video

1. (a) Calculate the length AC.

$$a^2 + b^2 = c^2$$

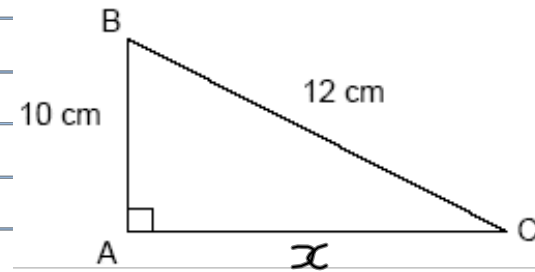
$$10^2 + x^2 = 12^2$$

$$100 + x^2 = 144$$

$$x^2 = 44$$

$$x = \sqrt{44}$$

$$= \underline{6.63 \text{ cm}} \quad (3 \text{ sf})$$



(3)

(b) A cuboid, ABCDEFGH, has sides 2 cm, 3 cm and 4 cm.

Calculate the length of the diagonal AG.

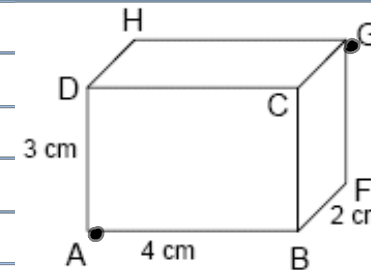
$$(AG)^2 = 4^2 + 2^2 + 3^2$$

$$= 16 + 4 + 9$$

$$= 29$$

$$AG = \sqrt{29}$$

$$= \underline{5.39 \text{ cm}} \quad (3 \text{ sf})$$



(2)

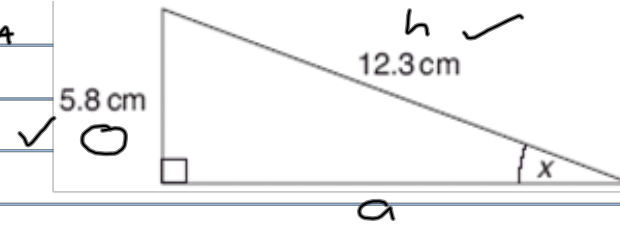
2. (a) Calculate the size of angle x .

S^o H C A T^o A

$$\sin x = \frac{5.8}{12.3}$$

$$x = \sin^{-1}\left(\frac{5.8}{12.3}\right)$$

$$= \underline{28.1^\circ}$$



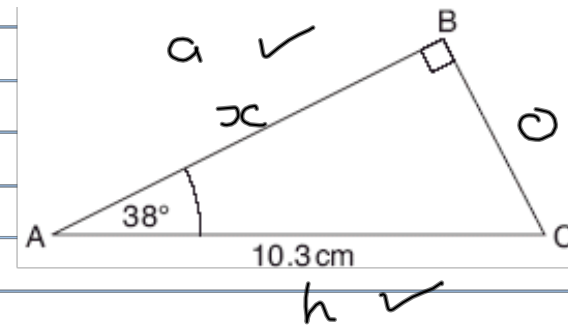
- (b) Calculate the length AB.

C^A H

$$\cos 38^\circ = \frac{x}{10.3}$$

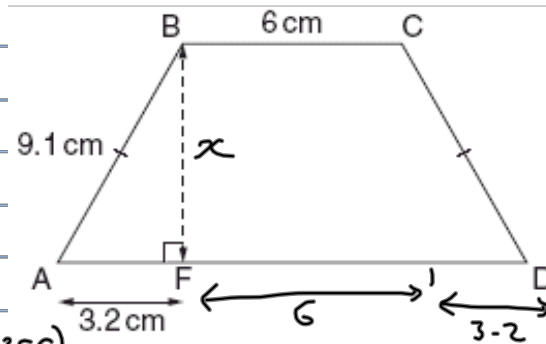
$$10.3 \times \cos 38^\circ = x$$

$$AB = x = \underline{8.12 \text{ cm}}$$



(3)

3. (a) ABCD is an isosceles trapezium.
BF is perpendicular to AD.



(i) Calculate BF.

$$9.1^2 = x^2 + 3.2^2$$

$$9.1^2 - 3.2^2 = x^2$$

$$x = \sqrt{9.1^2 - 3.2^2}$$

$$= \underline{8.52 \text{ cm}} \text{ (3sf)}$$

(3)

- (ii) Calculate the area of ABCD.

$$a = 6 \quad b = 12.4$$

$$A = \frac{1}{2}(a+b)h$$

$$= \frac{1}{2}(6 + 12.4) \times 8.52 \dots = \underline{78.4 \text{ cm}^2} \text{ (3sf)}$$

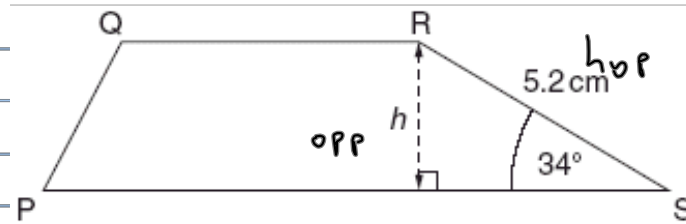
(3)

- (b) PQRS is a trapezium.

$\text{SO}^{\circ} \text{H} \text{C}^{\circ} \text{HT}^{\circ} \text{A}$

Calculate h .

$$\sin 34^{\circ} = \frac{h}{5.2}$$



$$5.2 \sin 34^{\circ} = h$$

$$h = \underline{2.91 \text{ cm}} \text{ (3sf)}$$

(3)

4. (a) A handrail, PQ , makes an angle x with the horizontal.

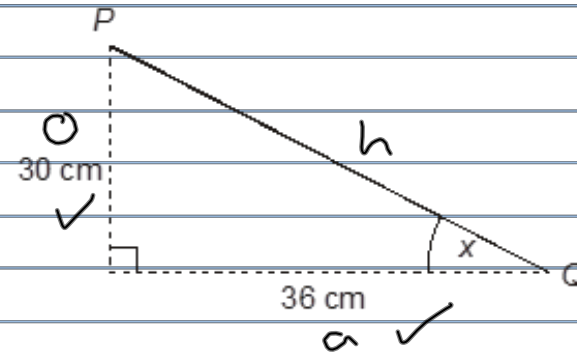
Calculate angle x .

$S^{\circ} H C^A H \textcircled{T^{\circ} A}$

$$\tan x = \frac{30}{36}$$

$$x = \tan^{-1}\left(\frac{30}{36}\right)$$

$$= \underline{39.8^{\circ}} \quad (3sf)$$



(3)

- (b) Some steps are replaced by a ramp, RS .

The ramp measures 620 cm and makes an angle of 5° with the horizontal.

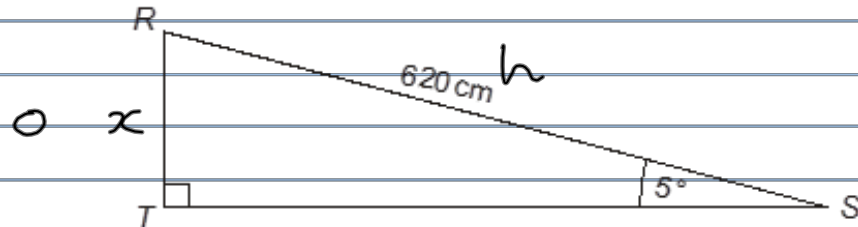
Calculate RT .

$S^{\circ} H$

$$\sin 5^{\circ} = \frac{x}{620}$$

$$620 \sin 5^{\circ} = x$$

$$x = \underline{54.0 \text{ cm}} \quad (3sf)$$



(3)

5. A lo ladder makes an angle of 74° with the floor.

The distance between the floor and the ceiling is 2.6 m.

Calculate the length, L , of the lo ladder.

$$\textcircled{S^{\circ}H} C^{\circ}H T^{\circ}A$$

$$\sin 74^\circ = \frac{2.6}{L}$$

($\times L$)

$$L \sin 74^\circ = 2.6$$

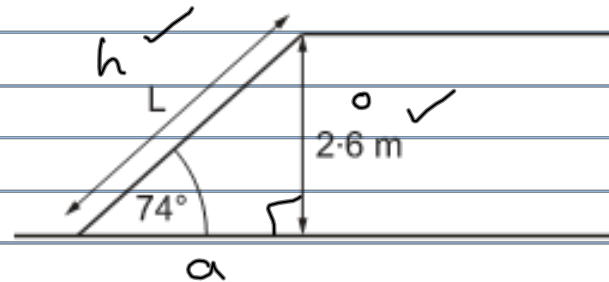
($\times L$)

($\div \sin 74^\circ$)

$$L = \frac{2.6}{\sin 74^\circ}$$

($\div \sin 74^\circ$)

$$= 2.70 \text{ cm (3sf)}$$



(3)

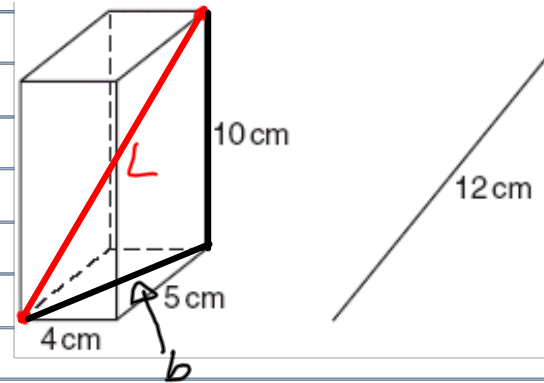
6. An empty box is a cuboid with internal measurements 4 cm by 5 cm by 10 cm.

Is it possible to fit a thin, straight rod that is 12 cm long entirely inside the box?

$$\begin{aligned}L^2 &= 4^2 + 5^2 + 10^2 \\ &= 16 + 25 + 100 \\ &= 141\end{aligned}$$

$$\begin{aligned}L &= \sqrt{141} \\ &= 11.9 \text{ cm (3sf)}\end{aligned}$$

No, the rod won't fit



$$\begin{aligned}b^2 &= 4^2 + 5^2 \\ &= 41\end{aligned} \quad (4)$$

$$\begin{aligned}L^2 &= 41 + 10^2 \\ &= 141\end{aligned}$$

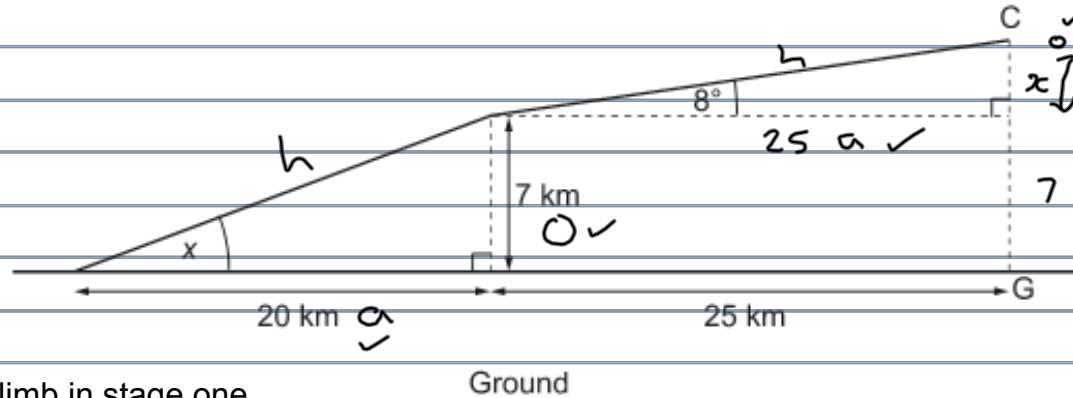
$$L = \underline{11.9 \text{ cm (3sf)}}$$

7. An aeroplane takes off and climbs to its cruising height in two stages.

Stage one: the aeroplane climbs to a height of 7 km and covers a horizontal distance of 20 km.

Stage two: the aeroplane climbs at an angle of 8° to the horizontal and covers a horizontal distance of 25 km.

S° H C A H T° A



(a) Calculate x , the angle of climb in stage one.

You must show your method.

$$\tan x = \frac{7}{20}$$

$$x = \tan^{-1}\left(\frac{7}{20}\right)$$

$$= \underline{19.3^\circ} \text{ (3sf)}$$

(b) Calculate CG, the cruising height of the aeroplane.

You must show your method.

$$\tan 8^\circ = \frac{x}{25}$$

$$25 \tan 8^\circ = x$$

$$x = 3.51\dots$$

$$CG = x + 7 = \underline{10.5 \text{ km}} \text{ (3sf)}$$