3.6 3D Pythagoras and Trigonometry: 10-minute Pack

AQA 8365 · Calculator allowed · about 10 minutes

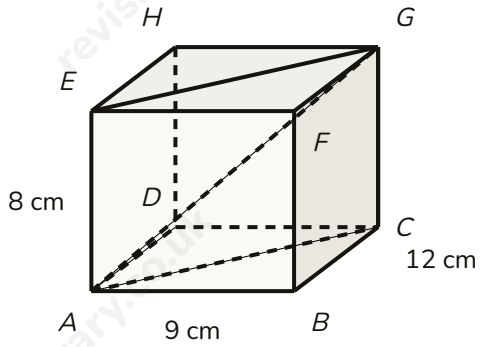
Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 A cuboid has length 9 cm, width 12 cm and height 8 cm. ABCD is the base, with AB = 9 cm and BC = 12 cm, and EFGH is the top face directly above, with E above A, F above B, G above C and H above D. AG is the space diagonal from base vertex A to the opposite top vertex G.

Diagram NOT accurately drawn



(a) Find the length of the diagonal AC of the base. **(2)**

(b) Find the length of the space diagonal AG. **(2)**

(c) Calculate the angle between AG and the base plane ABCD, giving your answer correct to 1 decimal place. **(2)**

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(d) Calculate the angle between AG and the vertical edge AE, giving your answer correct to 1 decimal place. **(2)**

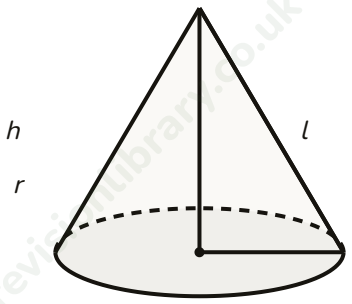
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(Total for Question 1 is 8 marks)

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2 A cone has base radius r and vertical height h. Which of the following gives the slant height l of the cone?

Diagram NOT accurately drawn



- ☐ A) $\sqrt{r^2 + h^2}$
- ☐ B) $\sqrt{r^2 - h^2}$
- ☐ C) $\sqrt{h^2 - r^2}$
- ☐ D) r + h

(Total for Question 2 is 1 mark)

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Mark scheme · 3.6 3D Pythagoras and Trigonometry: 10-minute Pack

Question 1

(a) AC = $\sqrt{9^2 + 12^2}$	**M1**
(a) AC = 15 cm cao	**A1**
(a) Answer: 15 cm	
(b) AG = $\sqrt{\text{their AC}^2 + 8^2}$	**M1**
(b) AG = 17 cm cao	**A1**
(b) Answer: 17 cm	
(c) sets up tan(angle) = height / their AC = 8/15	**M1**
(c) angle = 28.1 degrees (1dp) cao	**A1**
(c) Answer: 28.1 degrees (1dp)	
(d) recognises the right-angled triangle AEG (right angle at E) with AE = 8 and EG = 15 (equal to AC)	**M1**
(d) angle EAG = 61.9 degrees (1dp) cao, using tan(angle) = 15/8	**A1**
(d) Answer: 61.9 degrees (1dp)	

Question 2

A cao	**B1**

Answer: A) $\sqrt{r^2 + h^2}$

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