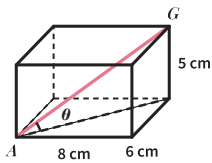


Pythagoras and trigonometry in 3D



1

Find the angle θ between the diagonal AG and the base $ABCD$. Give your answer to 1 decimal place.



$$AC^2 = 8^2 + 6^2 = 100$$

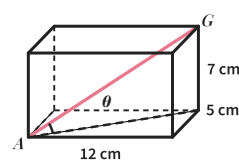
$$AC = 10 \text{ cm}$$

$$\tan \theta = \frac{5}{10} \quad \theta = 26.6^\circ$$

Answer _____

2

Find the angle θ between the diagonal AG and the base $ABCD$. Give your answer to 1 decimal place.



$$AC^2 = 12^2 + 5^2 = 169$$

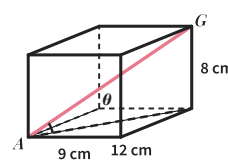
$$AC = 13 \text{ cm}$$

$$\tan \theta = \frac{7}{13} \quad \theta = 28.1^\circ$$

Answer _____

3

Find the angle θ between the diagonal AG and the base $ABCD$. Give your answer to 1 decimal place.



$$AC^2 = 9^2 + 12^2 = 225$$

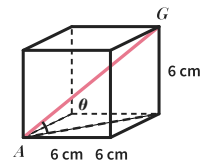
$$AC = 15 \text{ cm}$$

$$\tan \theta = \frac{8}{15} \quad \theta = 28.1^\circ$$

Answer _____

4

Find the angle θ in this cube between the diagonal AG and the base $ABCD$. Give your answer to 1 decimal place.

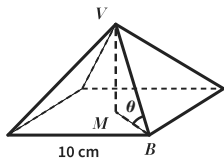


$$\tan \theta = \frac{6}{6\sqrt{2}} \quad \theta = 45.0^\circ$$

Answer _____

5

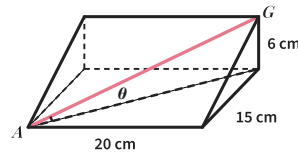
A pyramid has a square base of side 10 cm. Its top is 9 cm above the centre of the base. Find the angle θ between the edge BV and the base.



Answer _____

6

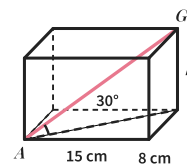
A ramp has a rectangular base 20 cm by 15 cm. The back edge is 6 cm high. Find the angle θ between AG and the base.



Answer _____

7

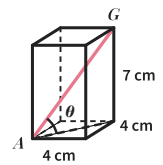
The diagonal AG makes an angle of 30° with the base. Find the height h .



Answer _____

8

Find the length of AG and the angle θ it makes with the base.



Answer _____

Pythagoras and trigonometry in 3D *further practice*



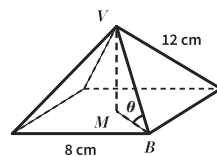
9

A crate is 50 cm long, 40 cm wide and 30 cm tall. A pole rests from one bottom corner to the opposite top corner. Find the angle the pole makes with the floor of the crate.

Answer _____

10

A pyramid has a square base of side 8 cm. Each sloping edge is 12 cm. Find the angle θ between an edge and the base.



Answer _____

11

A box has a square base of side 10 cm. Its diagonal AG makes an angle of 40° with the base. How tall is the box?

Answer _____

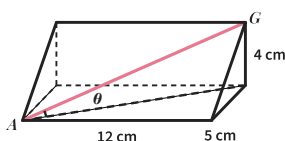
12

A tent is a square based pyramid. The base has sides of 6 m. Each sloping edge makes an angle of 65° with the ground. How tall is the tent?

Answer _____

13

Find the angle θ between AG and the base of this ramp.



Answer _____

14

A field is a rectangle 40 m by 30 m. A 15 m mast stands upright at one corner. Find the angle of elevation of the top of the mast from the opposite corner.

Answer _____

15

A box has a square base. Its diagonal AG is 20 cm and makes an angle of 35° with the base. Find the length of a side of the base.

Answer _____

16

A cuboid is 3 cm by 4 cm by 12 cm tall. Ali says the angle between AG and the base is $\tan^{-1}(12 \div 4) = 71.6^\circ$. Explain his mistake and find the angle.

Answer _____