G227 3D Pythagoras and trigonometry

Q1.

The diagram shows a triangular prism.

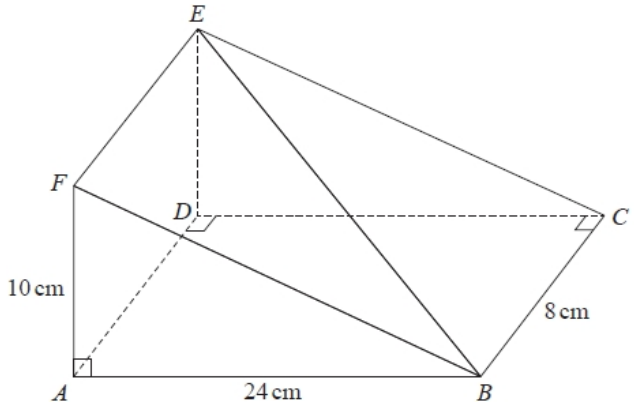


Diagram **NOT** accurately drawn

AF = 10 cm, *AB* = 24 cm and *BC* = 8 cm.
Angle *FAB* = angle *ADC* = angle *BCD* = 90°

Work out the size of the angle between the line *BE* and the plane *ABCD*.
Give your answer correct to 1 decimal place.

..... °

(Total for question = 3 marks)

Q2.

The diagram shows a cuboid *ABCDEFGH*.

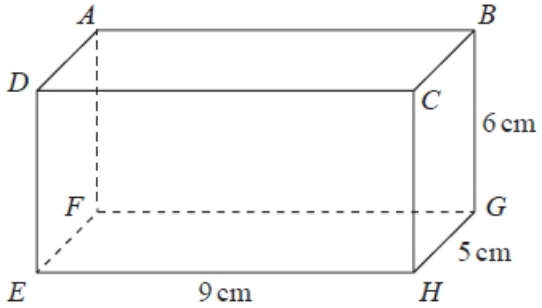


Diagram **NOT** accurately drawn

EH = 9 cm, *HG* = 5 cm and *GB* = 6 cm.

Work out the size of the angle between *AH* and the plane *EFGH*.
Give your answer correct to 3 significant figures.

..... °

(Total for question = 4 marks)

Q3.

The diagram shows cuboid *ABCDEFGH*.

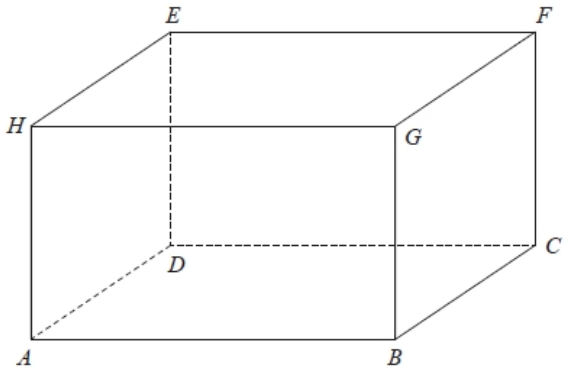


Diagram **NOT** accurately drawn

For this cuboid

the length of *AB* : the length of *BC* : the length of *CF* = 4 : 2 : 3

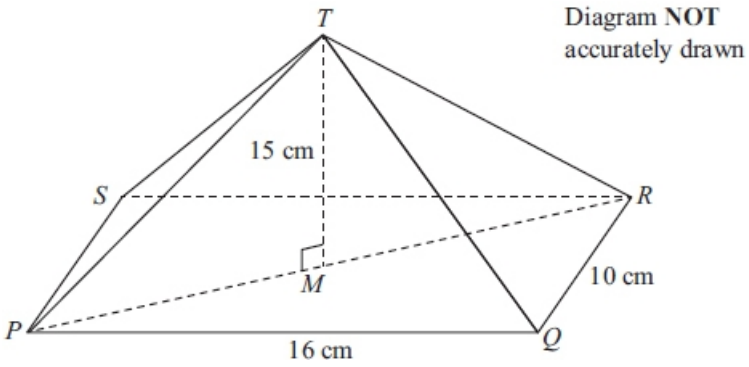
Calculate the size of the angle between AF and the plane *ABCD*.
Give your answer correct to one decimal place.

..... °

(Total for question = 3 marks)

Q4.

The diagram shows a pyramid with a horizontal rectangular base *PQRS*.
PQ = 16 cm.
QR = 10 cm.
M is the midpoint of the line *PR*.
The vertex, *T*, is vertically above *M*.
MT = 15cm.



Calculate the size of the angle between *TP* and the base *PQRS*.
Give your answer correct to 1 decimal place.

.....°

(Total for question = 4 marks)

Q5.

The diagram shows a triangular prism with a horizontal rectangular base *ABCD*.
AB = 10 cm. *BC* = 7 cm.
M is the midpoint of *AD*.
The vertex *T* is vertically above *M*.
MT = 6 cm.

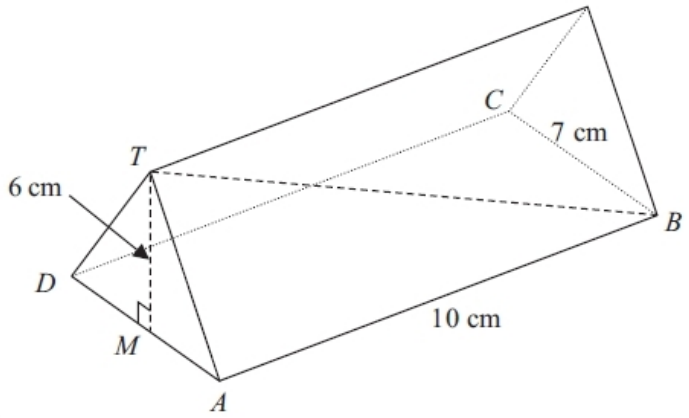


Diagram **NOT** accurately drawn

Calculate the size of the angle between *TB* and the base *ABCD*.

Give your answer correct to 1 decimal place.

.....°

(Total for question = 4 marks)

Q6.

ABCDE is a square-based pyramid.

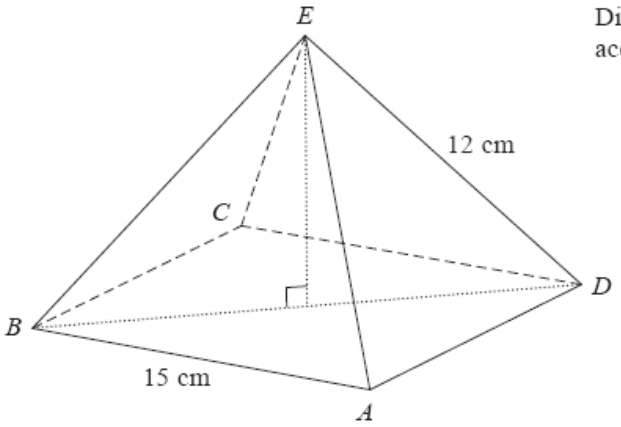


Diagram **NOT** accurately drawn

AE = *BE* = *CE* = *DE* = 12 cm
AB = 15 cm

Calculate the size of angle *DEB*.
Give your answer to the nearest degree.

..... °

(Total for question = 4 marks)

Q7.

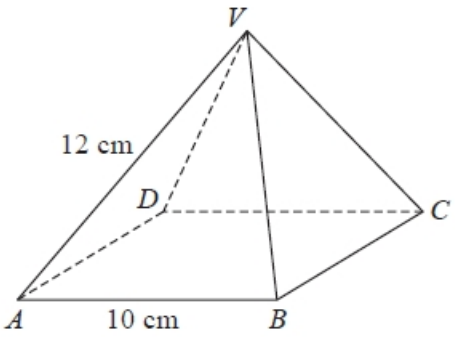


Diagram **NOT** accurately drawn

ABCD is the square base of the pyramid *VABCD*.

AB = *BC* = *CD* = *DA* = 10 cm.
VA = *VB* = *VC* = *VD* = 12 cm.

Calculate the height of the pyramid.
Give your answer correct to 3 significant figures.

..... cm

(Total for question = 4 marks)

Q8.

ABCDEFGH is a cuboid.

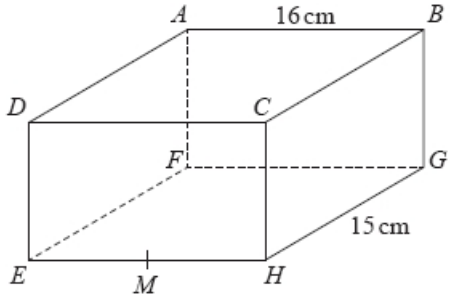


Diagram **NOT** accurately drawn

AB = 16 cm and *HG* = 15 cm.
M is the midpoint of *EH*.

BM makes an angle of 24° with the base *EFGH*.

Calculate the height, *BG*, of the cuboid.
Give your answer correct to 3 significant figures.

..... cm

(Total for question = 4 marks)

Q9.

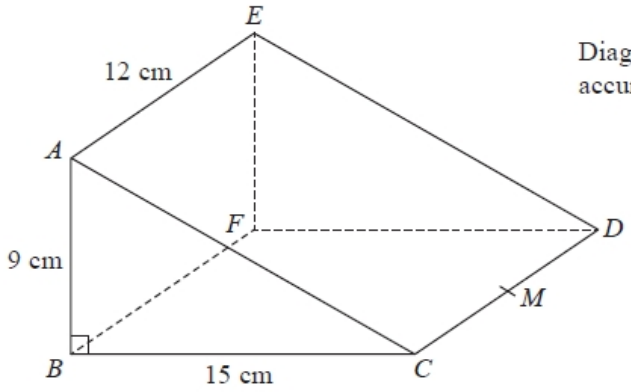


Diagram **NOT** accurately drawn

ABCDEF is a triangular prism.
AB = 9 cm, *BC* = 15 cm and *AE* = 12 cm.
Angle *ABC* = 90°
M is the midpoint of *CD*.

Calculate the size of the angle between *AM* and the plane *BCDF*.
Give your answer correct to 1 decimal place.

..... °

(Total for Question is 5 marks)

Q10.

A pyramid has a horizontal square base *ABCD* with sides of length 230 metres.
M is the midpoint of *AC*.
The vertex, *T*, is vertically above *M*.
The slant edges of the pyramid are of length 218 metres.

Calculate the height, *MT*, of the pyramid.
Give your answer correct to 3 significant figures.

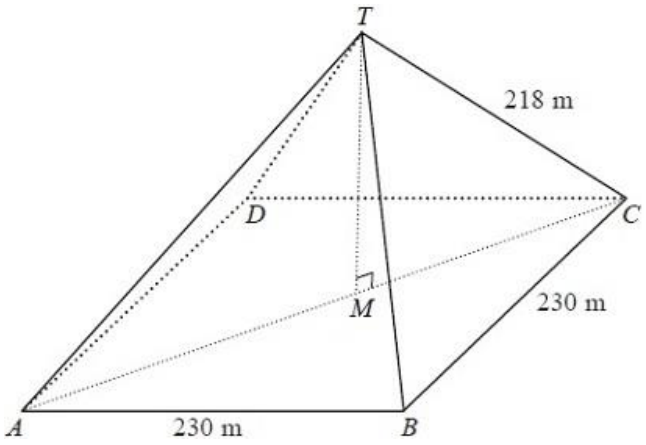


Diagram **NOT** accurately drawn

..... m

(Total for Question is 5 marks)