Name: SOLUTIONS

GCSE (1 - 9)

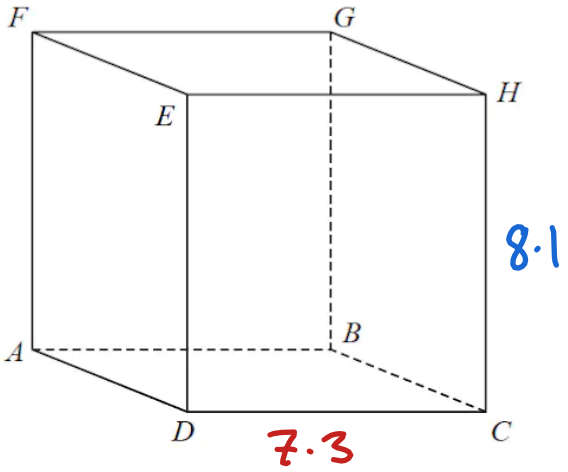
Trigonometry in 3D

These questions represent all of the times that this topic has appeared in unlocked Pearson Edexcel GCSE maths papers.

Question	Where the question appeared
1	Edexcel, GCSE, Summer 2018, Paper 2H, Q18
2	Edexcel, GCSE, Autumn 2018, Paper 3H, Q12
3	Edexcel, GCSE, Summer 2019, Paper 2H, Q19

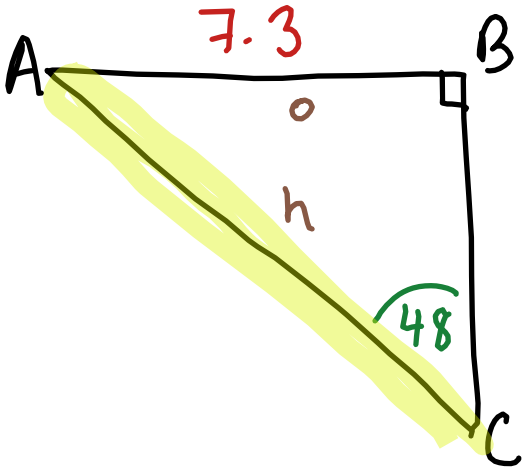
1

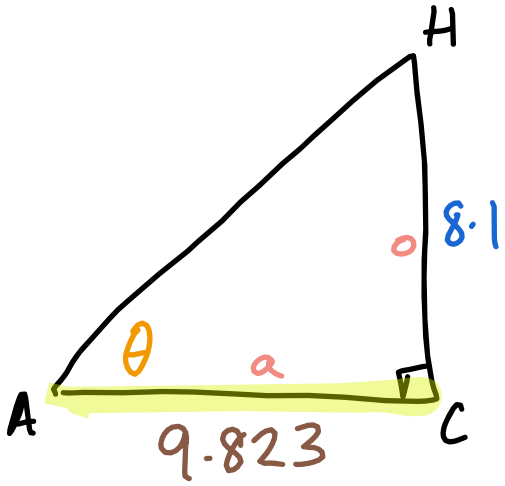
ABCDEFGH is a cuboid.



$AB = 7.3$ cm
$CH = 8.1$ cm
Angle $BCA = 48°$

Find the size of the angle between AH and the plane $ABCD$.
Give your answer correct to 1 decimal place.





$h = \frac{opp}{\sin\theta}$

$\theta = \tan^{-1}\left(\frac{8.1}{9.823}\right)$

$AC = \frac{7.3}{\sin(48)} = 9.823$

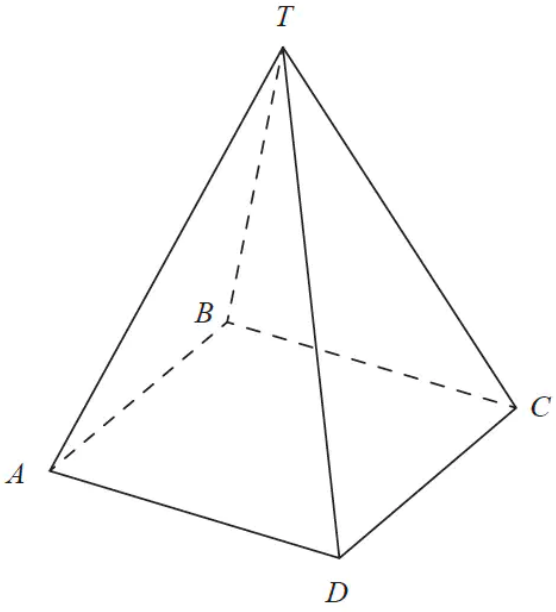
$\theta = 39.5$ °

(Total for Question 18 is 4 marks)

[Edexcel, GCSE, Summer 2018, Paper 2H, Q18]

2

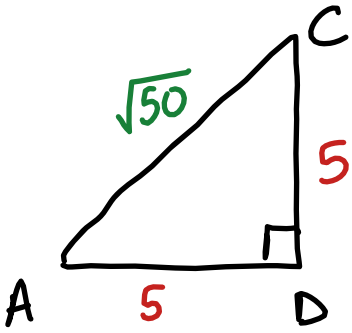
Here is a pyramid with a square base $ABCD$.

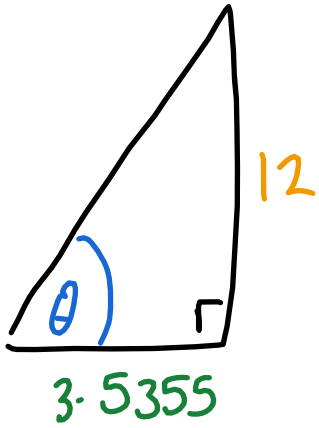


$AB = 5\,\text{m}$

The vertex T is 12 m vertically above the midpoint of AC.

Calculate the size of angle TAC.





$\sqrt{50} = 7.071$

$7.071 \div 2 = 3.5355$

$\theta = \tan^{-1}\left(\frac{12}{3.5355}\right)$

$\theta = 73.6°$

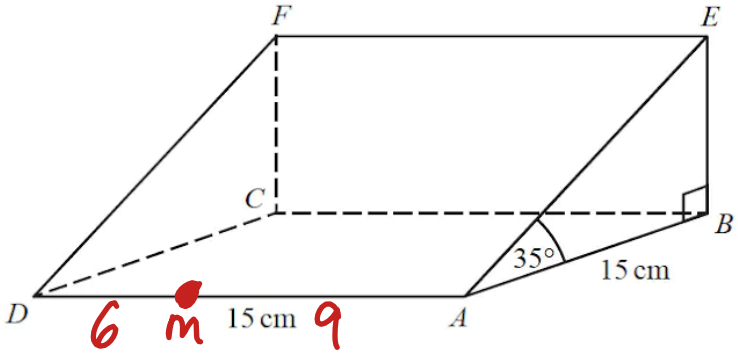
73.6 °

(Total for Question 12 is 4 marks)

[Edexcel, GCSE, Autumn 2018, Paper 3H, Q12]

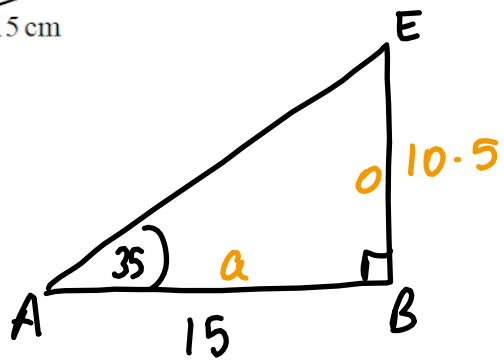
3

The diagram shows a triangular prism.



$EB = \tan(35) \times 15$

$EB = 10.5$

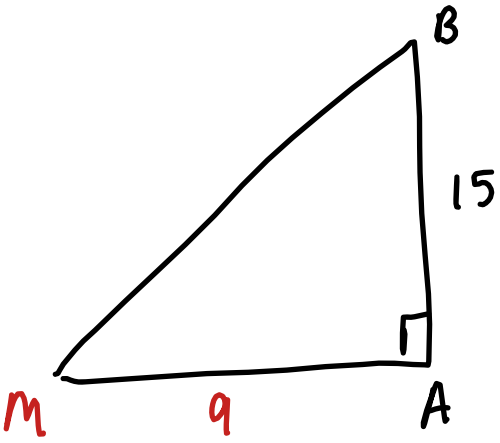


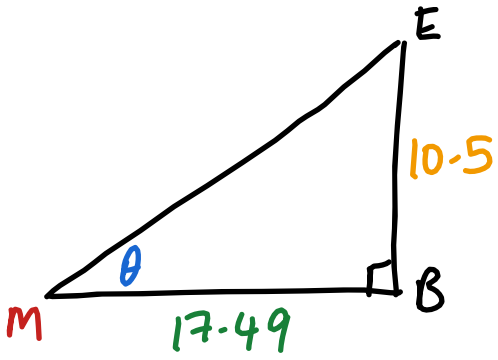
The base, $ABCD$, of the prism is a square of side length 15 cm.
Angle ABE and angle CBE are right angles.
Angle $EAB = 35°$

M is the point on DA such that

$$DM : MA = 2 : 3$$

Calculate the size of the angle between EM and the base of the prism.
Give your answer correct to 1 decimal place.





$MB^2 = 9^2 + 15^2$

$MB^2 = 306$

$MB = \sqrt{306}$

$MB = 17.49$

$\theta = \tan^{-1}\left(\frac{10.5}{17.49}\right) = 30.974$

31.0 °

(Total for Question 19 is 4 marks)

[Edexcel, GCSE, Summer 2019, Paper 2H, Q19]