3D Trig Hardest Exam Qs Ever

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Questions in past papers often come up combined with other topics.
Topic tags have been given for each question to enable you to know if you can do the question or whether you need to wait to cover the additional topic(s).

Scan the QR code(s) or click the link for instant detailed model solutions!

21 The diagram shows the prism $ABCDEF$ with cross section triangle ABC.

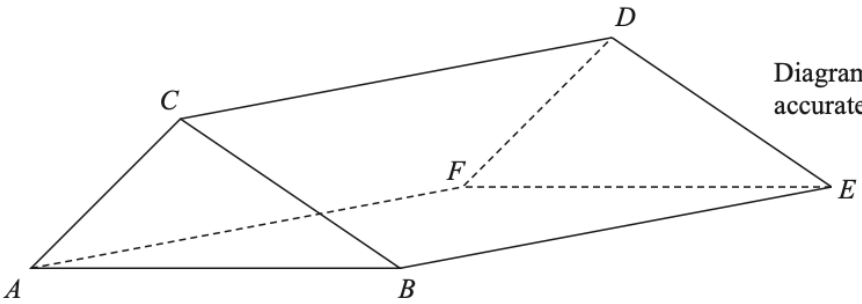


Diagram **NOT** accurately drawn

Angle $BEC = 40°$ and angle ACB is obtuse.
$AC = 6$ cm and $CE = 13$ cm

The area of triangle ABC is $22\,\text{cm}^2$

Calculate the length of AB.
Give your answer correct to one decimal place.

..... cm

(Total for Question 21 is 6 marks)

21 The diagram shows the prism $ABCDEFGHJK$ with horizontal base $AEFG$

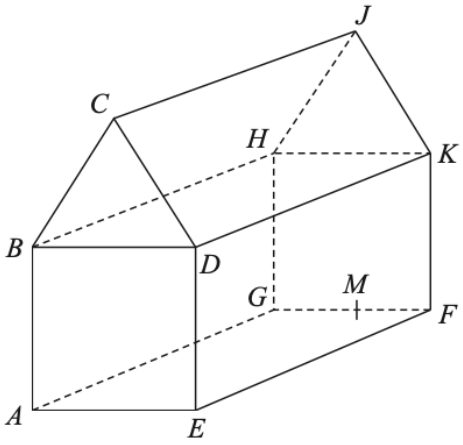


Diagram **NOT** accurately drawn

$ABCDE$ is a cross section of the prism where
$ABDE$ is a square
BCD is an equilateral triangle

$EF = 2 \times AE$
M is the midpoint of GF so that JM is vertical.

Angle $MAJ = y°$

Given that $\tan y° = T$

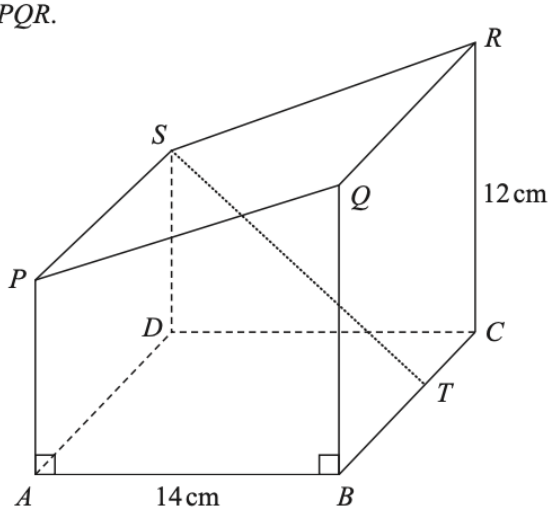
find the value of T, giving your answer in the form $\dfrac{\sqrt{p} + \sqrt{q}}{17}$ where p and q are integers.

$T =$ .....

(Total for Question 21 is 5 marks)

Qualification: GCSE Edexcel Higher
Areas: Trigonometry
Subtopics: 3D Trig, Ratio With Shapes, Ratio, 2D Shapes - Area Of A Trapezium, Pythagoras' Theorem, SOHCAHTOA
Paper: Paper-3H-Calculator / Series: 2022-June / Difficulty: Very Hard / Question Number: 18

18 Here is a prism $ABCDSPQR$.



The base $ABCD$ of the prism is a square of side 14 cm
T is the point on BC such that $BT : TC = 4 : 3$

The cross section of the prism is in the shape of a trapezium of area 147 cm^2
$CR = 12$ cm

Find the size of the angle between the line ST and the base $ABCD$.
Give your answer correct to 1 decimal place.

.....°

(Total for Question 18 is 5 marks)