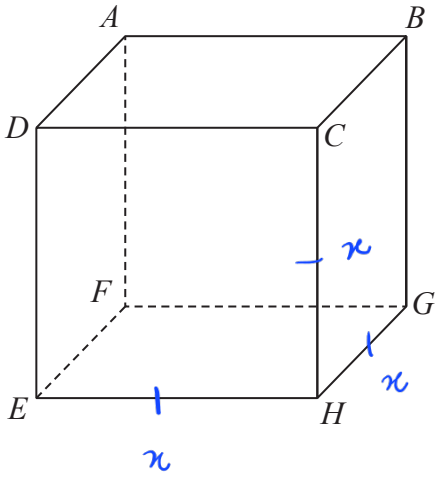
**1** The diagram shows a cube.




$AH = 11.3$ cm correct to the nearest mm.

Calculate the lower bound for the length of an edge of the cube.
You must show all your working.

Error interval for 1 dp = $\frac{0.1}{2} = 0.05$

Lower bound for AH = $11.3 - 0.05$

$= 11.25$ cm (1)

(length of a diagonal)$^2$ = (length)$^2$ + (width)$^2$ + (height)$^2$

$AH^2 = x^2 + x^2 + x^2$ (1) cube = equal sides

$11.25^2 = 3x^2$ (1)

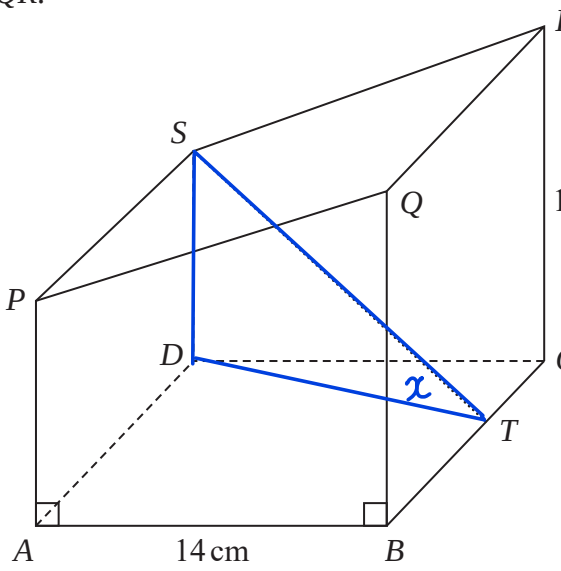
$x = 6.495$ (1)

6.495

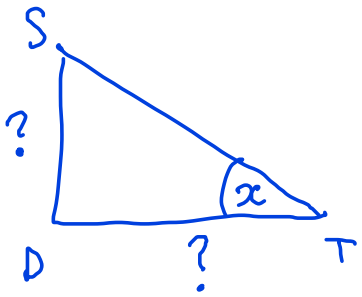
..... cm

**(Total for Question 1 is 4 marks)**

**2** Here is a prism *ABCDSPQR*.

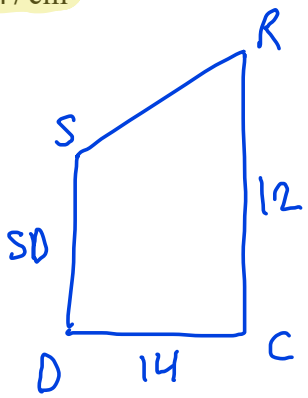



Method: find the lengths SD and DT, then use trig




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



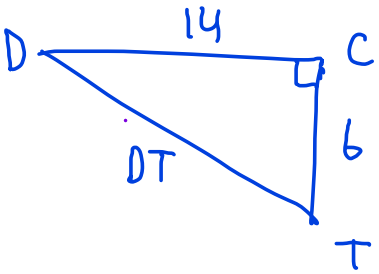

Find the size of the angle between the line *ST* and the base *ABCD*.
Give your answer correct to 1 decimal place.

ABCD square so BC = 14

BT : TC
×2 (4 : 3 ×2)
8 : 6

4 + 3 = 7
14 ÷ 7 = 2

so TC = 6cm (1)



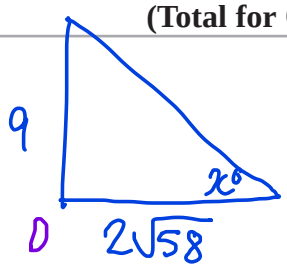

Area of Trapezium SDCR
$= \frac{SD + 12}{2} \times 14$

$147 = 7SD + 84$

$\Rightarrow SD = \frac{147 - 84}{7} = 9$ (1)

$DT = \sqrt{14^2 + 6^2}$

$= 2\sqrt{58}$ (1)




$x = \tan^{-1}\left(\frac{9}{2\sqrt{58}}\right)$ (1)

$= 30.577...$

(1)

30.6 °

**(Total for Question 2 is 5 marks)**