

Using the Pythagorean Theorem in 3-Dimensions

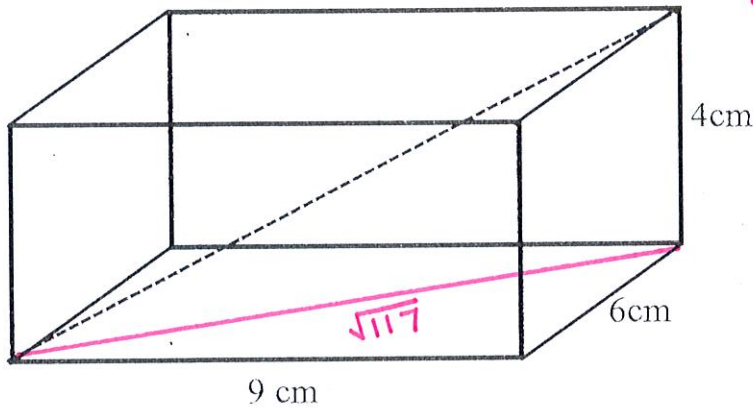
Big Idea: Three dimensional figures have 2 dimensional cross sections

Example:

Find the length of the dotted line.

Exact: $\sqrt{133}$

Approximation: 11.53 cm



$$\begin{aligned} a^2 + b^2 &= c^2 \\ 6^2 + 9^2 &= c^2 \\ 36 + 81 &= c^2 \\ 117 &= c^2 \\ \sqrt{117} &= c \end{aligned}$$

$$\begin{aligned} a^2 + b^2 &= c^2 \\ 4^2 + \sqrt{117}^2 &= c^2 \\ 16 + 117 &= c^2 \\ 133 &= c^2 \\ \sqrt{133} &= c \\ 11.53 &\approx c \end{aligned}$$