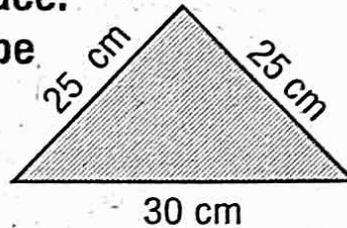


4. A square pyramid is to be made with the triangle shown here as a lateral face.

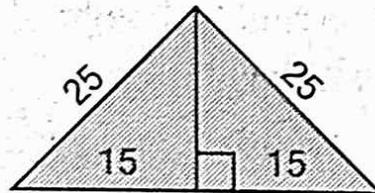
What would be its height?

What if the base edge is

40 centimetres instead of 30 centimetres?

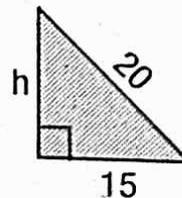


Consider the right triangle with the lateral edge of the square pyramid as hypotenuse and half the base edge and slant height as perpendicular sides.



$$\begin{aligned} \text{Slant height, } l &= \sqrt{25^2 - 15^2} \\ &= \sqrt{625 - 225} \\ &= \sqrt{400} = 20 \text{ cm} \end{aligned}$$

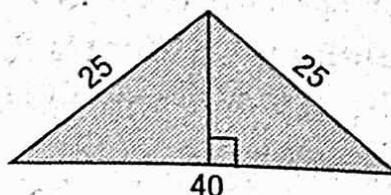
Consider the right triangle with slant height as hypotenuse and half the base edge and height as perpendicular sides.



$$\begin{aligned} h &= \sqrt{20^2 - 15^2} = \sqrt{400 - 225} \\ &= \sqrt{175} = 13.23 \text{ cm} \\ &\text{(using calculator)} \end{aligned}$$

$$\begin{aligned} \text{Height of the square pyramid} \\ &= 13.23 \text{ cm} \end{aligned}$$

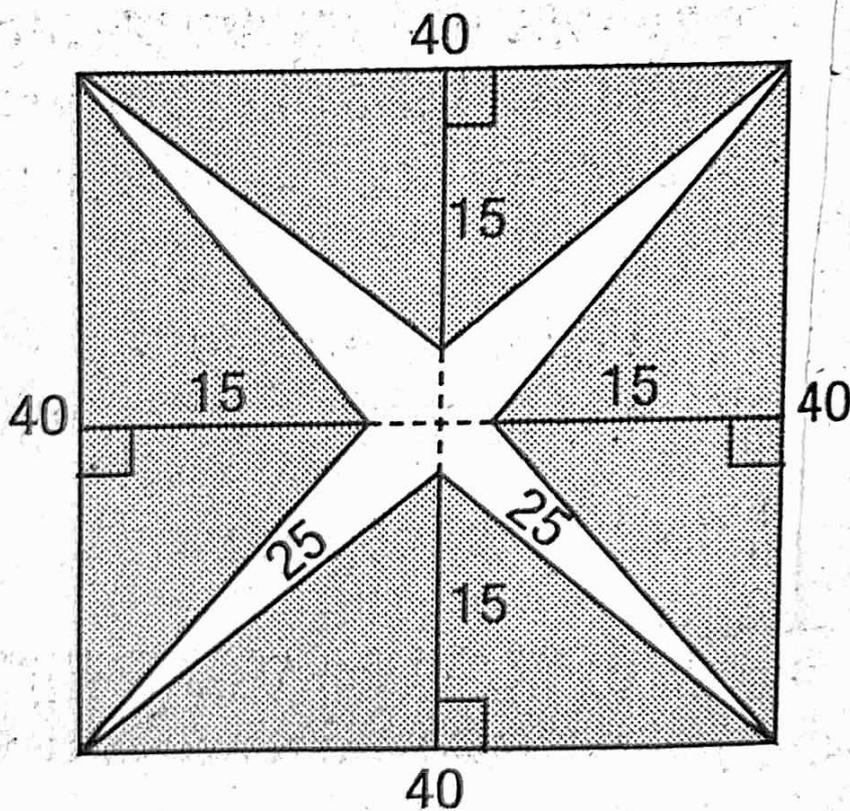
If we take the base edge as 40 cm instead of 30 cm,



then slant height

$$\begin{aligned} &= \sqrt{25^2 - 20^2} = \sqrt{625 - 400} \\ &= \sqrt{225} = 15 \text{ cm} \end{aligned}$$

Base edges are 40 cm each. If we place isosceles triangles with height 15 cm, on the bases, a pyramid cannot be formed.



It can be explained in another way.

$$l = 15, \frac{a}{2} = 20$$

$$h^2 = 15^2 - 20^2 = 225 - 400 = -175$$

$$h = \sqrt{-175}$$

As a negative number has no square root, it is not possible to find the value of h . So a pyramid with these measures cannot be formed.