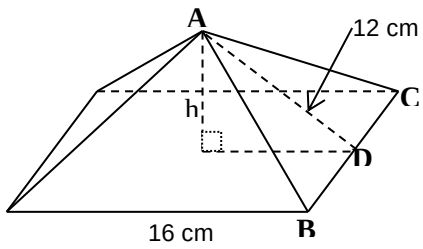
Pythagoras' Theorem – Word Problems

Genius

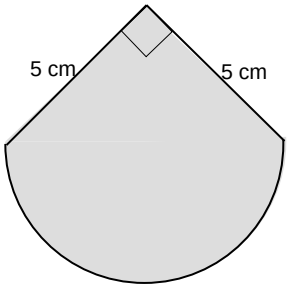
1. The square-based pyramid on the right has a base edge length of 20 cm. Each of the triangular faces has a height of 15 cm, ie, AD has length 15 cm.



   a. Draw only the right-angled triangle in the diagram. Label all vertices.

   b. Use Pythagoras' Theorem to find the perpendicular height, *h*.

2. a. Sketch the shape alongside. Add a line to make a right-angled triangle.



   b. Find the area of the right-angled triangle.

   c. Find the length of the hypotenuse of the right-angled triangle.

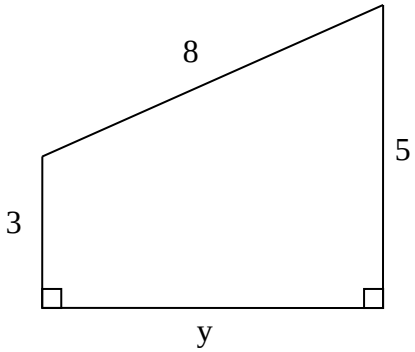
   d. Find the radius of the semicircle.

   e. Find the area of the semicircle.

   f. Find the area of the shape

3. I have a ladder that is 10 metres long. I lean it against a wall. The foot of the ladder is 3 metres from the base of the wall.
   a. Draw a neat diagram of this situation. Label the diagram. Let *h* = height that the ladder reaches up the wall.
   b. Use Pythagoras' Theorem to find *h*, to the nearest centimetre.

4. a. Sketch the shape alongside. Add a line to make a right-angled triangle.



   b. Use Pythagoras' Theorem to find the value of *y* in the diagram alongside.

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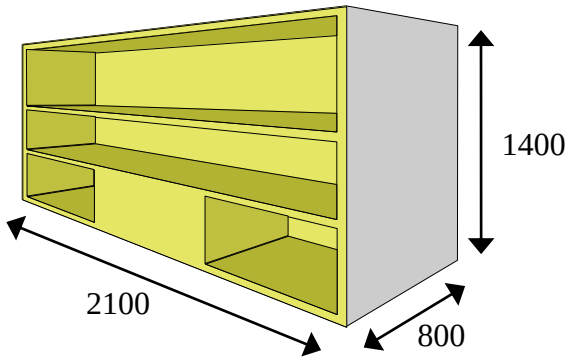
5. You are building the bookcase at the right. To finish it, you want to put a diagonal brace across the back.



   a. This problem involves a right-angled triangle. Draw the triangle, labeling all vertices and sides.

   b. How long should the brace be?

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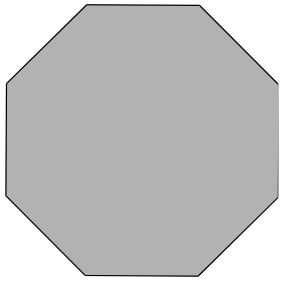
6. Calculate the **exact** area of the regular octohedron on the right.



3 cm

GigaGenius

7. Each circle in the diagram on the right has a radius of 1 cm. What is the length and width of the rectangle that surrounds them? SHOW ALL WORKING!