Volume and Surface Area of Prisms and Pyramids

Polyhedron: A three-dimensional object with faces that are polygons.

Prism:

A prism is a three-dimensional solid (a polyhedron). The top and bottom (the bases) are parallel, identical polygons. The lateral faces are rectangles; they meet the bases at right angles. A prism are named by the shape of its bases, for example, rectangular prism, triangular prism, square-based prism.

Volume of any Prism: Surface Area:

$$V = A_{base} \times height \qquad\qquad A_{total} = 2 \times A_{base} + A_{rectangles}$$

Pyramid:

A pyramid is a three-dimensional solid (a polyhedron) with a polygon-shaped base. The remaining sides are triangles that come to a point at the top.

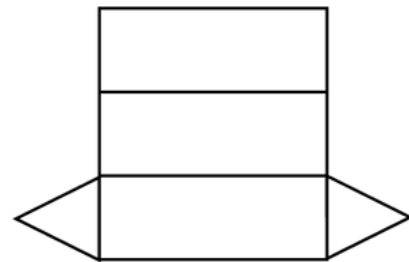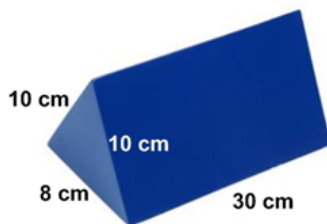https://www.youtube.com/watch?v=qXC8uzy_HFw

Volume of any Pyramid: Surface Area:

$$V = \frac{1}{3}(A_{base} \times height) \qquad\qquad A_{total} = A_{base} + A_{triangles}$$
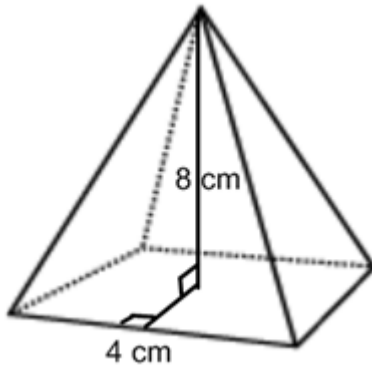
Example 1: Calculate the volume and the surface area of the following triangular-based prism.

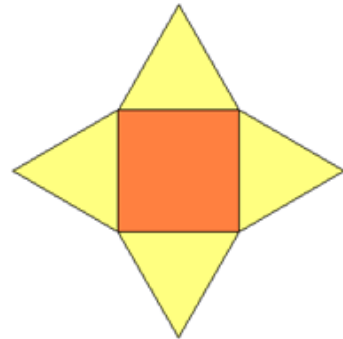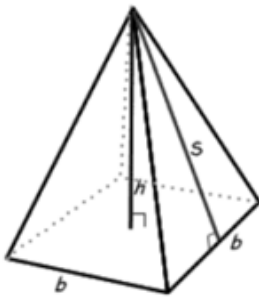**Example 2**: Calculate the volume of the following square-based pyramid.

8 cm

4 cm

Example 3: Calculate the surface area of the square-based pyramid in example 2.

s

h

b

b

Example 4: A box of chocolates has a volume of 80 cm³.
If its length is 10 cm and its height is 2 cm, what is its width?