§13.1 Polyhedra and other Solid Shapes.
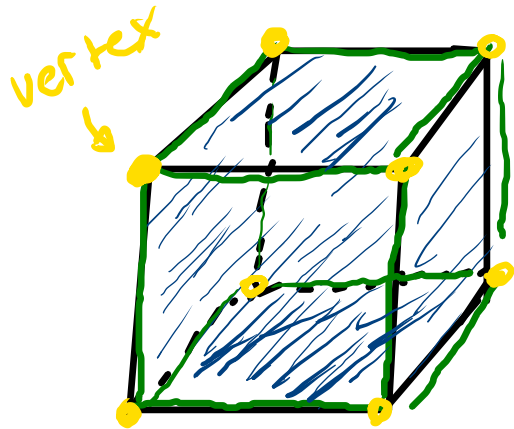
A **Polyhedra** is a Closed, Connected Shape in 3-Dimension whose outer Surface Consist of Polygons. (△, ▭, ◻, ⬡).

EX)

vertex

Each Polyhedra has:

① Faces. ✶
② Edges ✶
③ Verticies. ✶

In the cube on the left

Faces: 1 bottom, 1 top + 4 lateral faces.
= 6 faces.

Edges: 4 bottom + 4 on top + 4 on Sides
= 12 Edges.

vertieies: 4 on Bottom and 4 on top.
= 8 vertieies

FYI: Side faces are Known as **Lateral Faces.**
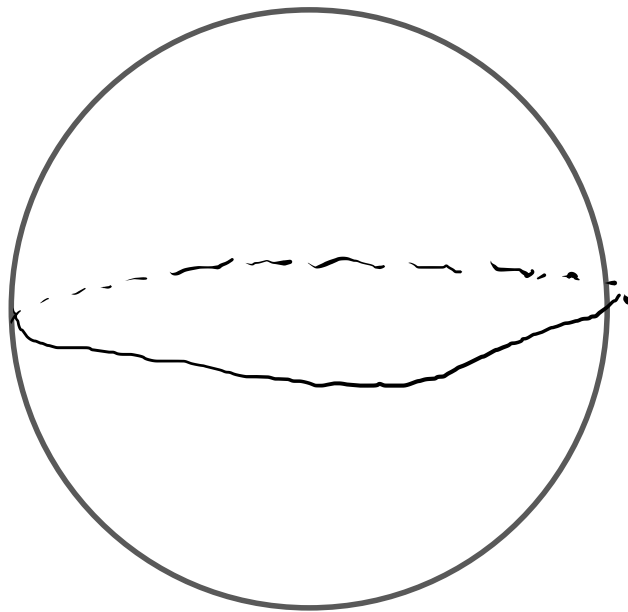
EXAMPLE This is a Polyhedra.

→ Apex.

Faces: 1 base. + 4 lateral faces. = 5 faces

Vertices: 4 from bottom + 1 Apex = 5 Vertices.

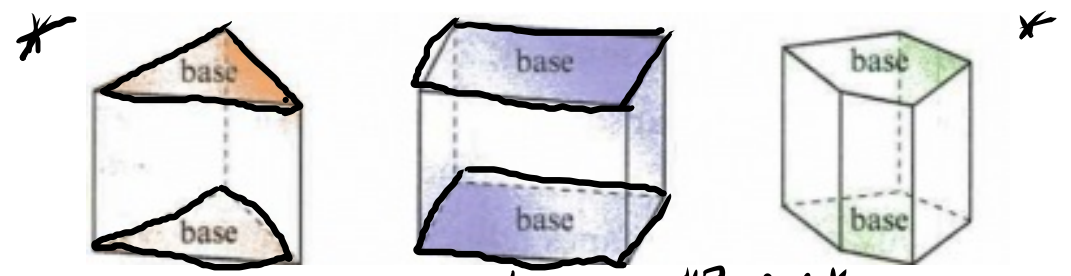Edges: 4 from base + 4 on sides = 8 Edges.

Q: Is a Sphere a Polyhedra?
  - No it's NOT. No Polygons any where.
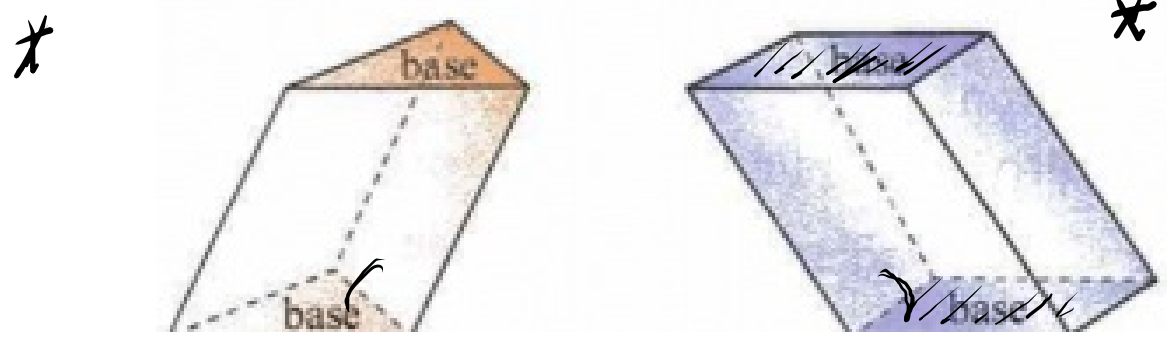
Special Types of Polyhedra

Prism: Top and bottom faces match up.
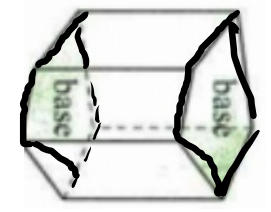
Pg 582 Figures 13.3, 13.4.

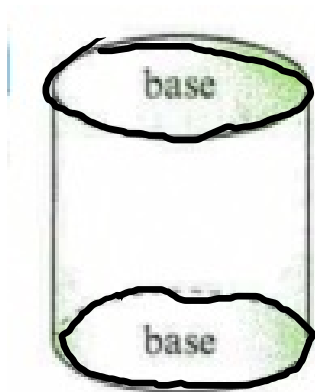⟶ "Right" Rectangular Prism.

* Right Prism.*

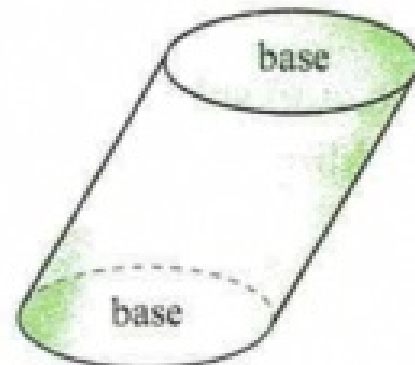* Oblique Prism*

Is this still a prism?

This is still a Prism.

Cylinders. : Similar Properties to Prism, that is the base is the Same Shape as the top. (being a circle or oval).
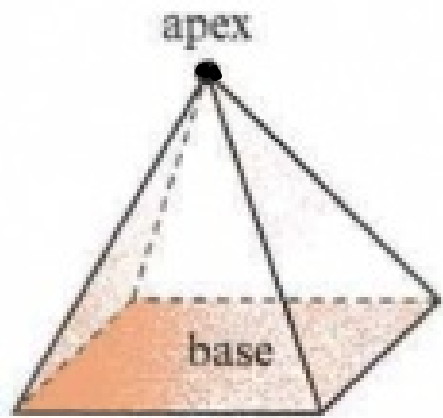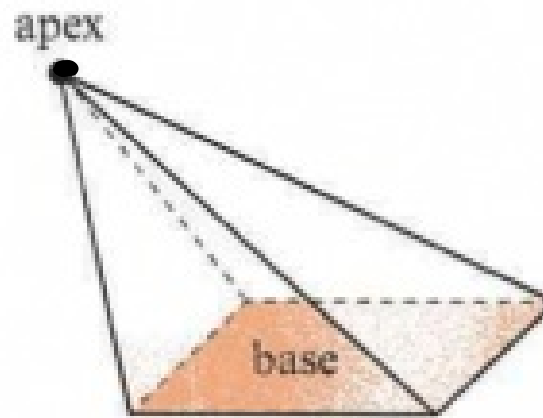

Right cylinder   Oblique cylinder   Right cylinder

Pyramids: Have an apex with lateral sides being Triangles. Base can be any Polygon.

Right rectangular pyramid
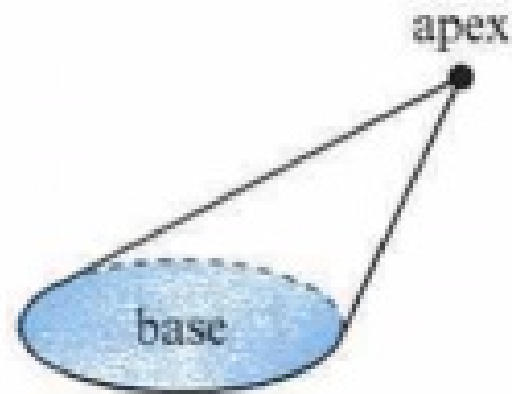
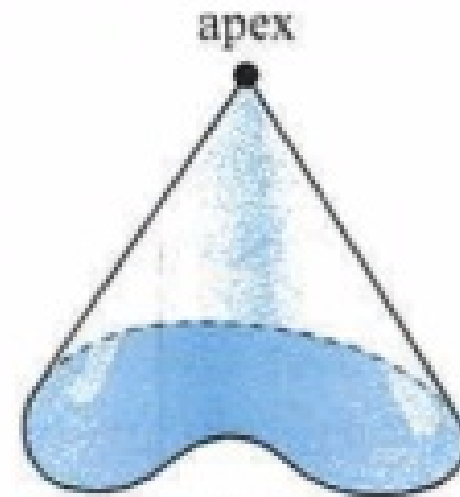Oblique rectangular pyramid

Right triangular pyramid

Cones: A closed shape/figure with an apex such that the base is NOT a polygon.

apex

apex

apex

base

base

Right
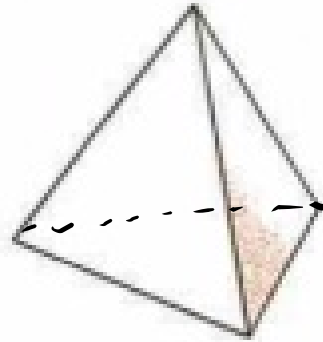circular cone

Oblique
circular cone

Right cone

Platonic Soild: A 3-Dimensional Shape that is formed by one Polygon.

EX] Cube   Tetrahedron.
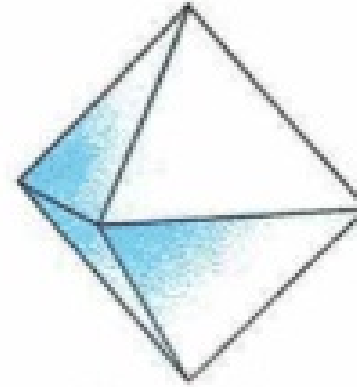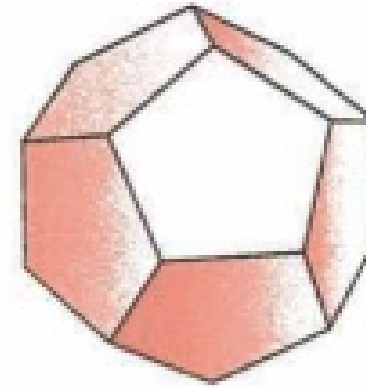

Tetrahedron
↳This is also a Pyramid.

Octahedron

Dodecahedron

Icosahedron

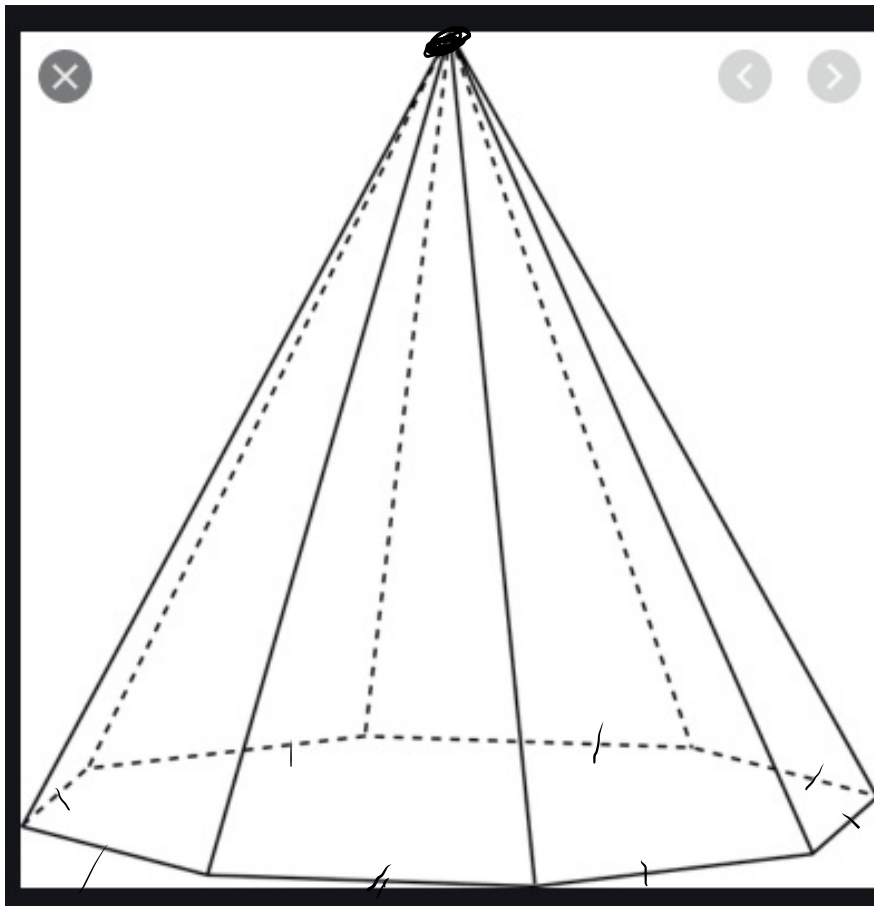1. What is the difference between a square and a cube? What is the difference between a triangle and a tetrahedron?

A Cube is 3-D and a Square is 2D.

A Tetrahedron is 3D and a Triangle is 2-D.

[
* Cube has a Square base
* Tetrahedron has a Triangle base.
]

③

3. Try to visualize a pyramid that has an octagonal base. How many faces, edges, and vertices does such a pyramid have?

Octogonal Pyramid.

Faces: 1 Base + 8 lateral faces
$= 9$ faces.

Edges: 8 from base + 8 from Sides
$= 16$ Edges.

Vertices: 8 base + 1 apex.
$= 9$ vertices.

#3

a. How many faces (including the base) does a pyramid with a rhombus base have? What shapes are the faces? Explain briefly.

b. How many edges does a pyramid with a rhombus base have? Explain. 8. The base has

~~edges & lateral edges rising to the apex.~~

c. How many vertices does a pyramid with a rhombus base have? Explain 5. The base has

Faces: 1 base + 4 triangles on sides.
= 5 faces.

Edges: 4 base + 4 lateral Edges.
= 8 Edges.

VERTICIES: 4 base + 1 apex
= 5 Vertices.