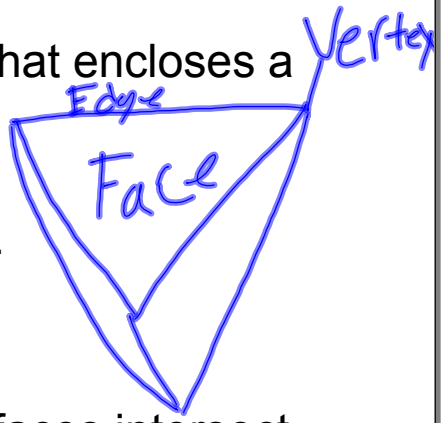
Chapter 12- 3D Objects

Polyhedron:

*A solid with flat surfaces that encloses a single region of space.



Face:

* Each of the flat surfaces.
* Shape will be a polygon.

Edges:

* The segment where the faces intersect.

Vertex:

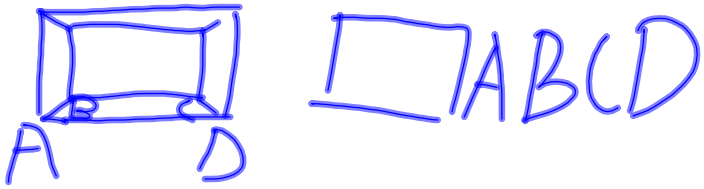
* Where the segments intersect.

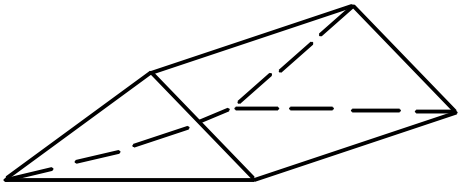
Prism:

* A polyhedron with 2 parallel congruent faces. (These are called **bases**.)

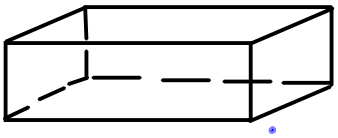
* All other faces are parallelogram shape.

* The figure is named for the base.

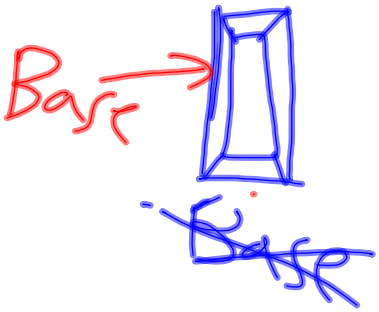




Triangular Prism



Rectangular Prism



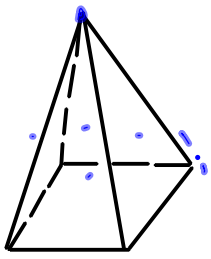
**Prisms may not always lie on its base, so you must be able to recognize these prisms regardless of their orientation

Pyramid:

* A polyhedron that has only one base.

* All faces, except one (the base) intersect at a single point, the vertex.

* Always named for the shape of the base.

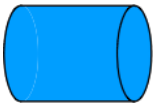


Square Pyramid

There are three-dimensional figures that are not polyhedrons because they do not have flat surfaces.

Cylinder:

* A solid with congruent circular bases in a pair of parallel planes.

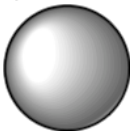


Cone:

* A solid with only one base that is circular in shape. It will have a vertex.

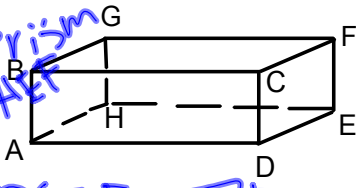
Sphere:

* A set of points in space that are a given distance from a given point.



1. Identify each solid. Name the bases, faces, edges, and vertices.

a.



Name: Rectangular Prism

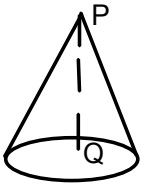
Bases: □ABCD □GHEF

Faces: □ABGH, □DCFE, □BGFC, □AHED

Edges: $\overline{AB}$, $\overline{BC}$, $\overline{CD}$, $\overline{DE}$

Vertices: B

b.



Name: Cone

Bases: ⊙Q

Faces: None

Edges: None

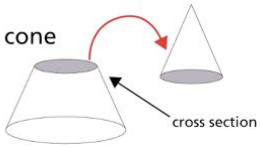
Vertices: P

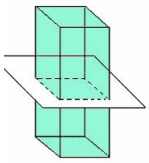
Cross Section:

* When a plane crosses (intersects) a solid figure.
* It will be the shape that you get.

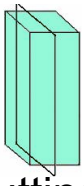
*Depending on how you slice it will depend on the shape you get.

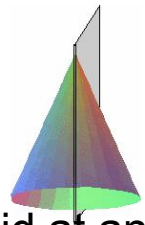
** Slicing parallel to the base will give you the same shape as the base.



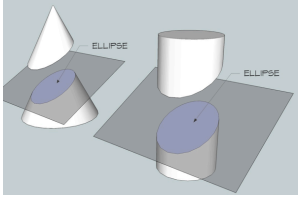


** Cutting to intersect the bases will result in a different shape.





** Cutting through the solid at an angle will result in a shape of the base, just altered a bit.



2. A carpenter purchased a section of a tree trunk. He wants to cut the trunk into a circle, an oval, and a rectangle. How could he cut the tree trunk to get each shape?

Circle: cut horizontally

Oval: cut on an angle

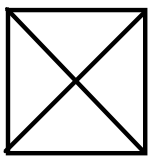
Rectangle: cut vertically

Orthogonal Drawing:

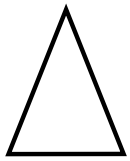
* The different views drawn two-dimensional of a three dimensional figure.

* The views will be: front, left, right, and top.

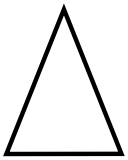
Square pyramid



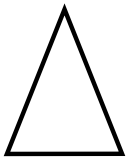
Top View



Left View



Right View



Front View

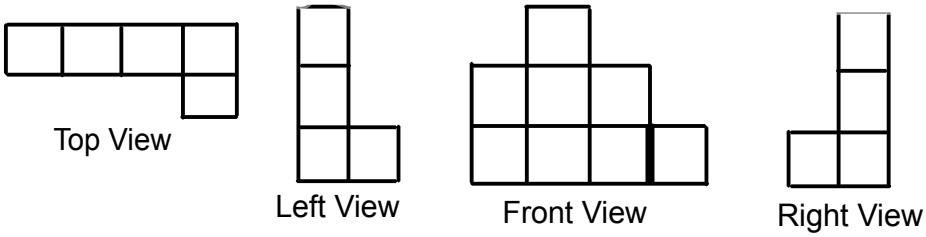
What shape do you think this represents?

Top View:
* Will help you see how many sections are belonging to the figure.

Front View:
* Will indicate which side (left or right) is taller.

Side View:
* Will indicate what the different heights of the figure will be.

3.



a. Draw the back view of a figure given its orthogonal drawing.