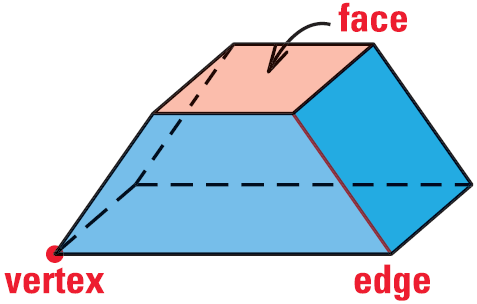
Geometry

12.1 Explore Solids

# Polyhedron

**polygonal**



Vertex

Edge

Face

* Solid with \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ sides

**Flat**

* \_\_\_\_\_\_\_\_\_\_\_\_ sides

Parts of Polyhedron

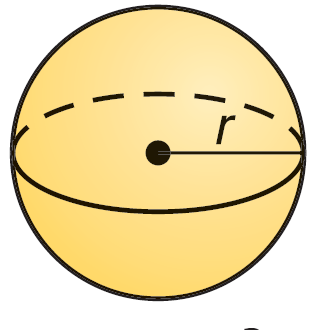
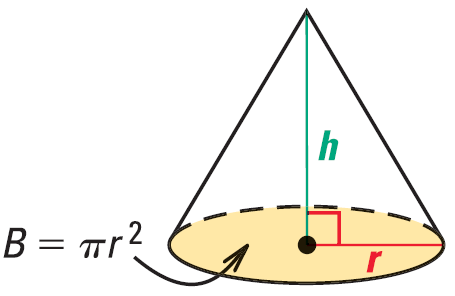
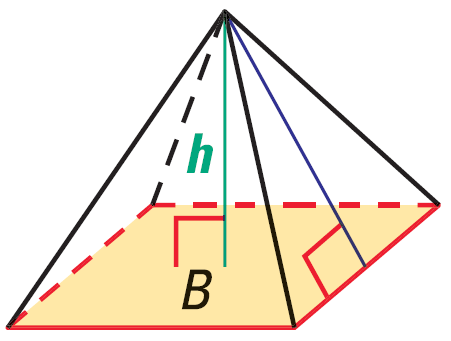
* Face
* Edge
* Vertex

# Types of Solids

Prism

**parallel**

**congruent**



Sphere

Pyramid

Cylinder

Prism

Cone

* Polyhedron with two \_\_\_\_\_\_\_\_\_\_\_ surfaces on \_\_\_\_\_\_\_\_\_ planes (the 2 ends (**\_\_\_\_\_\_\_\_\_\_\_\_**) are the same)

**bases**

**bases**

* Named by \_\_\_\_\_\_\_\_

Cylinder

**circular**

* Solid with congruent \_\_\_\_\_\_\_\_\_\_\_ bases on parallel planes

Pyramid

**face**

* Polyhedron with all but one \_\_\_\_\_\_\_\_ intersecting in one \_\_\_\_\_\_\_\_\_\_

**point**

Cone

**base**

* Circular \_\_\_\_\_\_\_\_\_ with the other surface meeting in a \_\_\_\_\_\_\_\_\_\_\_\_

**point**

Sphere

**distance**

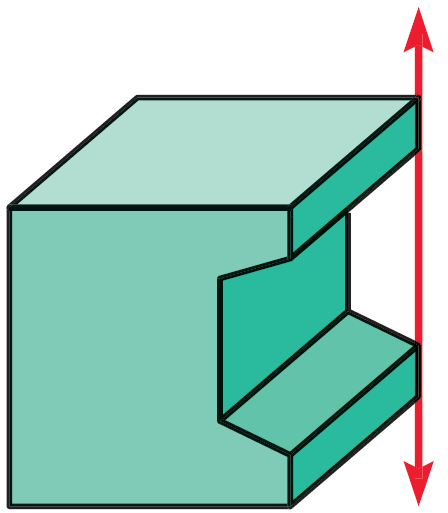
**points**

* All the \_\_\_\_\_\_\_\_\_\_ that are a given \_\_\_\_\_\_\_\_\_\_ from the center

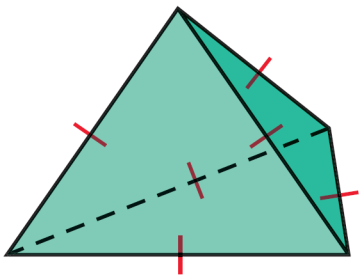
## Euler’s Theorem

The number of faces (F), vertices (V), and edges (E) of a polyhedron are related by

Convex



concave



convex

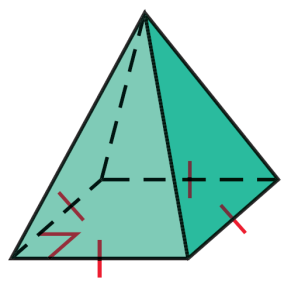
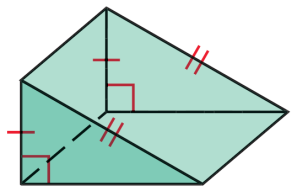
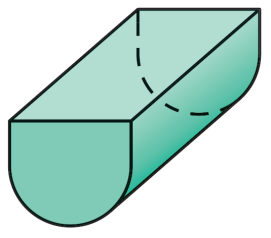
* Any two points can be connected with \_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**a segment completely inside the polyhedron**

Concave

**convex**

* Not \_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Has a “**cave**”

Tell whether the solid is a polyhedron. If it is, name the polyhedron and find the number of faces, vertices, and edges and describe as convex or concave.

Not a Polyhedron

Polyhedron; Square Pyramid; 5 faces, 5 vertices, 8 edges; convex

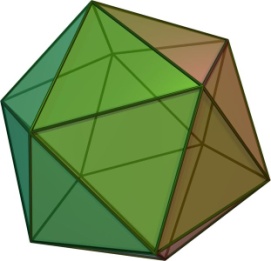
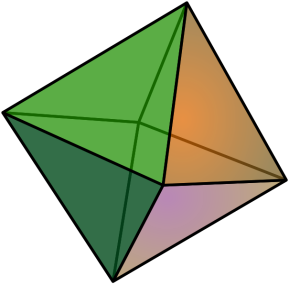
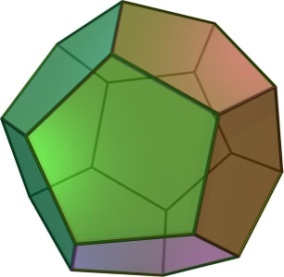
Polyhedron; Triangular Prism; 5 faces, 6 vertices, 9 edges; convex

# Regular Polyhedron

* Polyhedron with \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ faces

**5**

**congruent regular polygonal**



Icosahedron

Hexahedron

Dodecahedron

Octahedron

Tetrahedron

* Only \_\_\_\_\_\_\_\_\_\_\_\_\_\_ types (**Platonic solids**)
* **Tetrahedron**

**4**

* + \_\_\_\_ faces (triangular pyramid)
* **Hexahedron**

**6**

* + \_\_\_\_ faces (cube)
* **Octahedron**

**8**

* + \_\_\_\_ faces (2 square pyramids put together)
* **Dodecahedron**

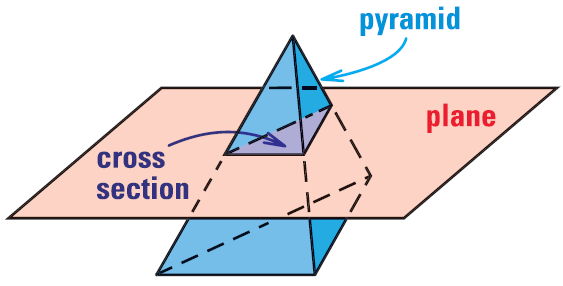
**12**

* + \_\_\_\_ faces (made with pentagons)
* **Icosahedron**

**20**

* + \_\_\_\_ faces (made with triangles)

# Cross Section

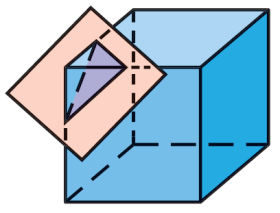
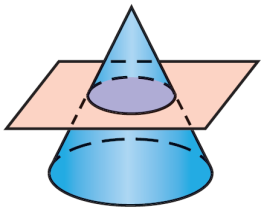
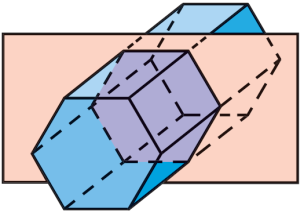
* Imagine slicing a very thin slice of the solid.

***2 dimensional shape***

* The cross section is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the thin slice.

Find the number of faces, vertices, and edges of a regular dodecahedron. Check with Euler’s Theorem.

12 Faces; 20 Vertices; 30 Edges

Describe the cross section.

***Hexagon***

***Circle***

***Triangle***

Assignment: 798 #2-40 even, 44-60 even = 29