

Do Now

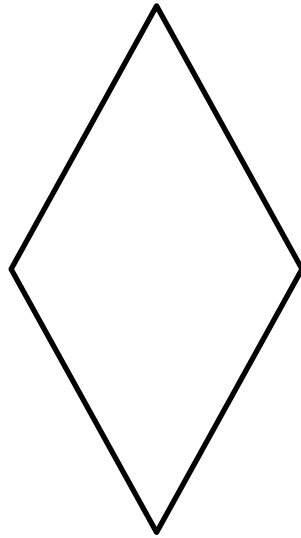
SAT Problem

The length of the longest side of a triangle is 10, and the remaining two sides have integer lengths. If the triangle is scalene, what is the smallest value of the perimeter of the triangle



Regular Polygon: A polygon that is both equilateral (all sides congruent), and equiangular (all angles congruent).

Can a polygon be equilateral without being equiangular?

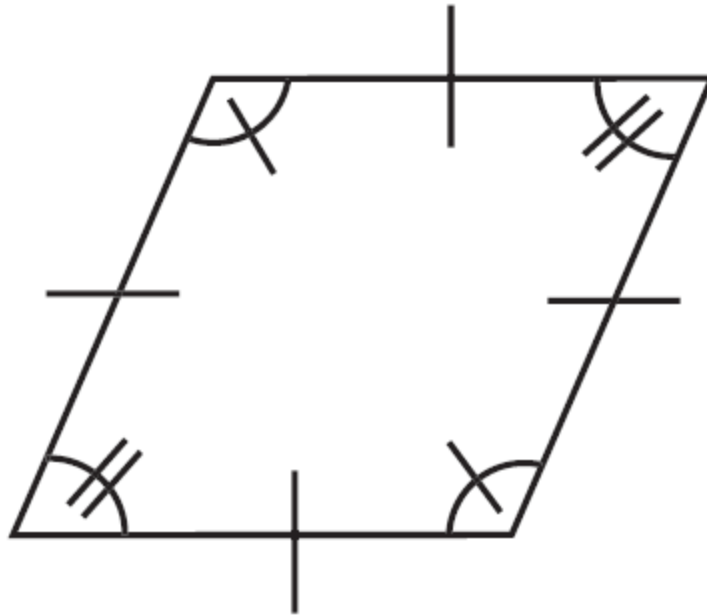


Reference
sheet

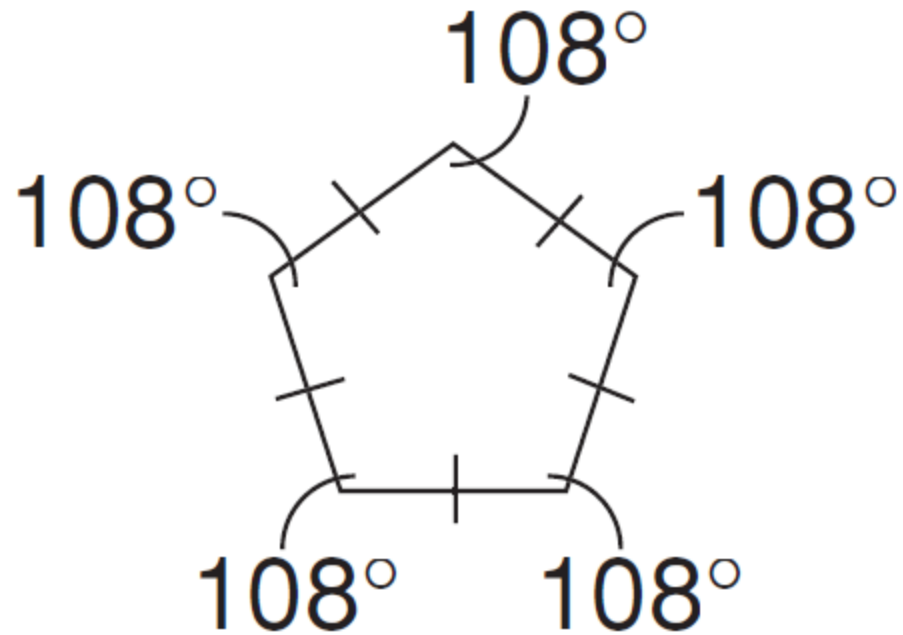
Can a polygon be equiangular without being equilateral?



Regular Polygon: Yes or No ?



Regular Polygon: Yes or No ?



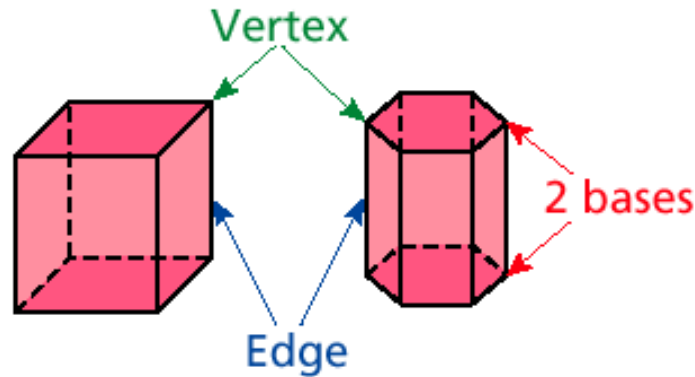
Polyhedron (plural: Polyhedra): A three-dimensional closed figure formed by joining polygons at their sides.

Each polygon of the polyhedron is called a **face** and joins multiple polygons along their sides. A line segment along which two faces meet is called an **edge**. A point where three or more edges meet is called a **vertex**.

Look at the geometry reference sheet I gave you yesterday (doc cam). Not all of these three-dimensional solids are polyhedra.

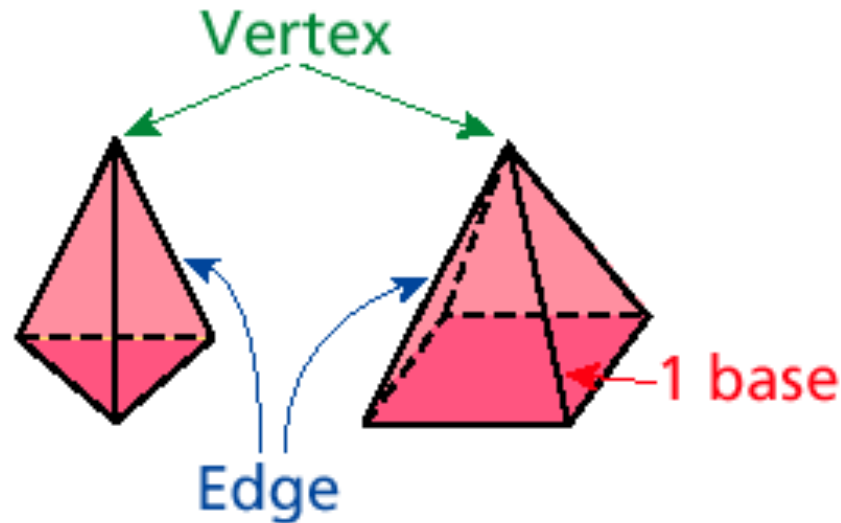
Prisms

A **prism** is a polyhedron that has two parallel, congruent bases. The bases can be any polygon. The other faces are parallelograms.

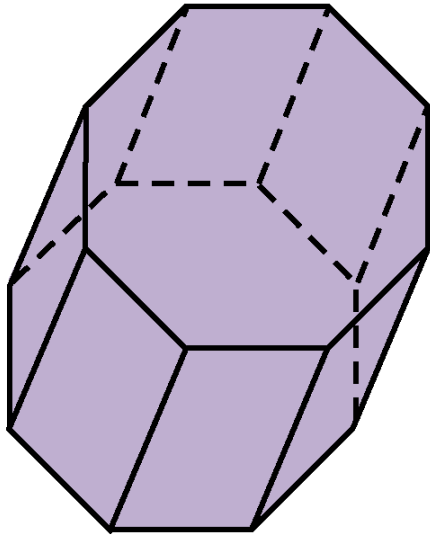


Pyramids

A **pyramid** is a polyhedron that has one base. The base can be any polygon. The other faces are triangles.



**Identify the bases and faces of the figure.
Then name the figure.**

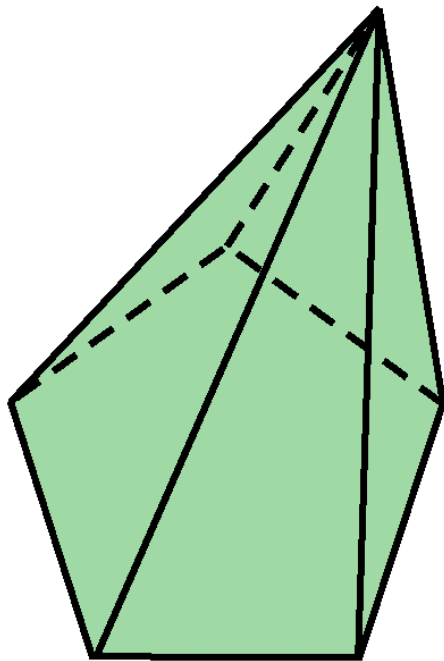


There are two octagonal bases.

There are eight rectangular faces.

The figure is an octagonal prism.

**Identify the bases and faces of the figure.
Then name the figure.**

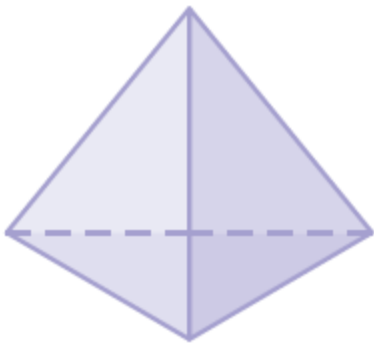


There is one base, and it is a pentagon.

There are five triangular faces.

The figure is a pentagonal pyramid.

**Identify the bases and faces of the figure.
Then name the figure.**

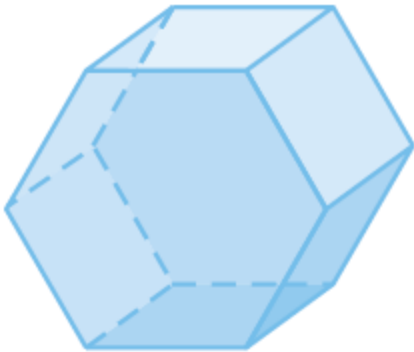


There is one base, and it is a triangle.

There are three triangular faces.

The figure is a triangular pyramid.

**Identify the bases and faces of the figure.
Then name the figure.**

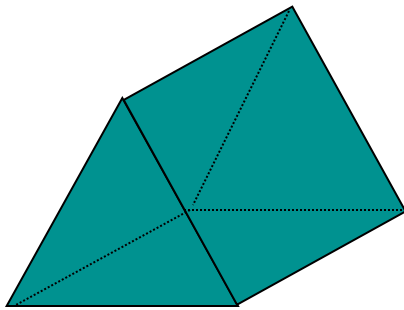


*There are two bases, and they
are both hexagons.*

There are six rectangular faces.

The figure is a hexagonal
prism.

**Identify the bases and faces of the figure.
Then name the figure.**

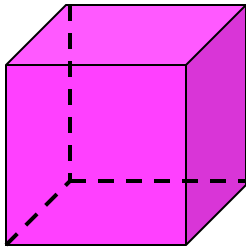


There are two bases and they are both triangles.

There are three rectangular faces.

The figure is a triangular prism.

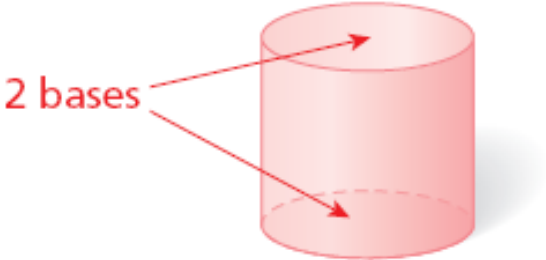
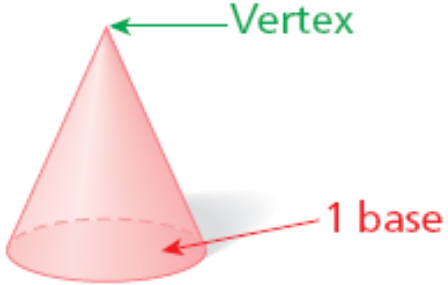
**Identify the bases and faces of the figure.
Then name the figure.**



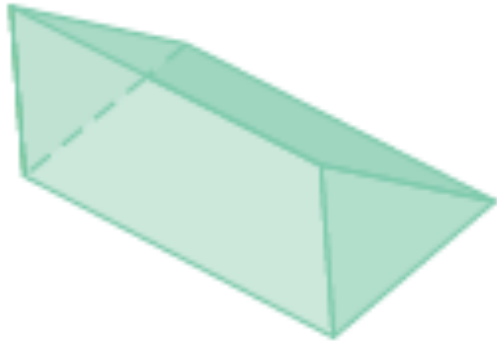
All faces and bases are congruent squares.

The figure is a cube.

Other three-dimensional figures include *cylinders* and *cones*. These figures are not polyhedrons because they are not made of faces that are all polygons.

Cylinders	Cones
<p data-bbox="233 696 880 796">A cylinder has two parallel, congruent bases that are circles.</p>  <p data-bbox="297 919 440 958">2 bases</p> <p>The diagram shows a 3D cylinder with a light red color. Two red arrows originate from the text '2 bases' and point to the top and bottom circular faces of the cylinder. The bottom face is represented by a dashed line to indicate it is hidden.</p>	<p data-bbox="1025 696 1750 853">A cone has one base that is a circle and a surface that comes to a point called the vertex.</p>  <p data-bbox="1367 908 1495 946">Vertex</p> <p data-bbox="1460 1105 1586 1143">1 base</p> <p>The diagram shows a 3D cone with a light red color. A green arrow points from the text 'Vertex' to the sharp point at the top of the cone. A red arrow points from the text '1 base' to the circular base at the bottom. The base is represented by a dashed line to indicate it is hidden.</p>

Classify each figure as a polyhedron or not a polyhedron. Then name the figure.

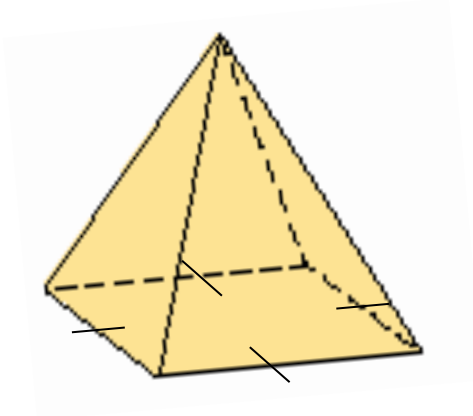


The faces are all polygons, so the figure is a polyhedron.

There are two triangular bases for the figure.

The figure is a triangular prism.

Classify each figure as a polyhedron or not a polyhedron. Then name the figure.



The faces are all polygons, so the figure is a polyhedron.

There is one rectangular base for the figure.

The figure is a rectangular pyramid.

There is a relationship between the number of faces, edges, and vertices. Focus only on the polyhedra and see if you can notice this relationship.

Faces	Edges	Vertices

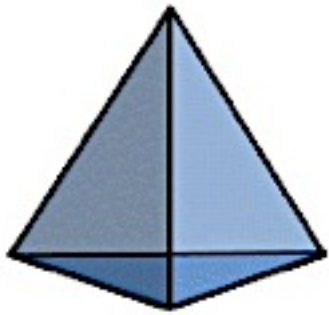


Euler's Polyhedron formula:

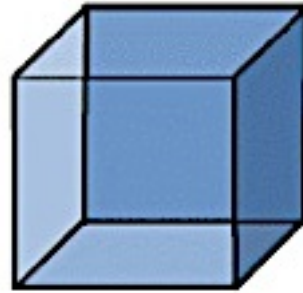
$$F - E + V = 2$$

The Platonic Solids are named after Plato, the well known Greek philosopher, mathematician, and teacher. A platonic solid is a **regular** polyhedron (all faces are congruent polygons).

Can you identify the Platonic Solids on your reference sheet?



Tetrahedron



Cube



Octahedron



Dodecahedron



Icosahedron