

Bellwork
05/02/12

Name the polygon by the number of sides.

1. **6** Hexagon

2. **10** decagon

3. **5** Pentagon

4. **What is a regular polygon?**

All sides \cong

All \angle 's \cong

Geometry
12.1 Explore Solids
Standard(s): 3

Vocabulary:

Polyhedron: A solid bounded by polygons (called faces).

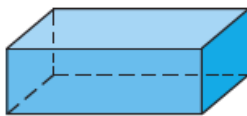
Edge: A line segment formed by the intersection of two faces.

Vertex: A point where three or more edges meet.

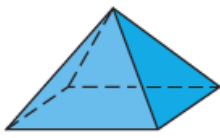
Regular: All faces are congruent regular polygons.

Convex: All sides point outwards.

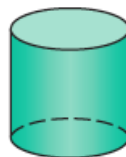
Concave: Any side caves inwards.

KEY CONCEPT*For Your Notebook***Types of Solids****Polyhedra**

Prism



Pyramid

Not Polyhedra

Cylinder



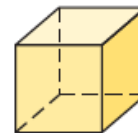
Cone



Sphere

THEOREM*For Your Notebook***THEOREM 12.1 Euler's Theorem**

The number of faces (F), vertices (V), and edges (E) of a polyhedron are related by the formula $F + V = E + 2$.



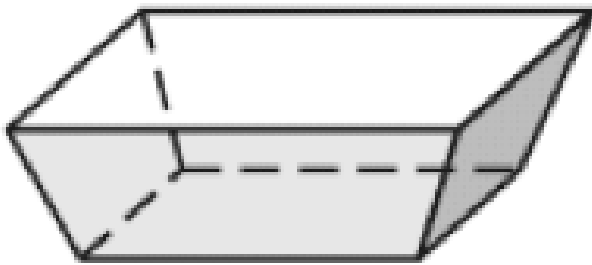
$$F = 6, V = 8, E = 12$$

$$6 + 8 = 12 + 2$$

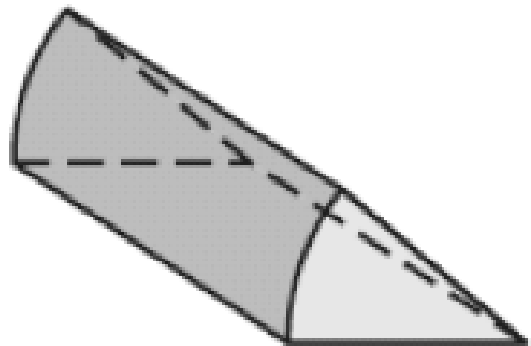
$$F + V = E + 2$$

Polyhedron or No?

Determine whether the solid is a polyhedron or not.



Yes!



No!

Euler's Theorem

Use Euler's Theorem to find the value of n .

Faces: 5
Vertices: 6
Edges: n

$$\begin{aligned}5 + 6 &= n + 2 \\ 11 &= n + 2 \\ n &= 9\end{aligned}$$

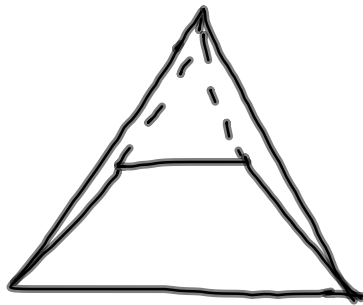
Faces: 8
Vertices: n
Edges: 18

$$\begin{aligned}8 + n &= 18 + 2 \\ 8 + n &= 20 \\ n &= 12\end{aligned}$$

Sketch a Polyhedron

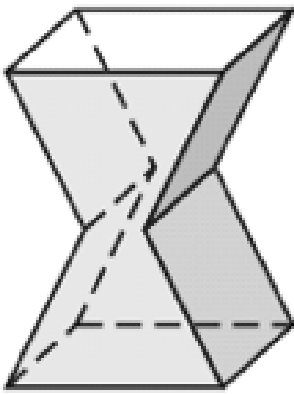
Sketch the polyhedron.

Trapezoidal Pyramid



Describe a Polyhedron

Find the number of faces, vertices, and edges of the polyhedron.
Check your answer using Euler's Theorem.



Concave

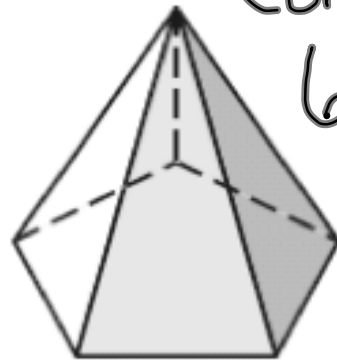
8 f.

12 v.

18 e.

$$8 + 12 = 18 + 2$$

$$20 = 20 \checkmark$$



Convex

6 f.

6 v.

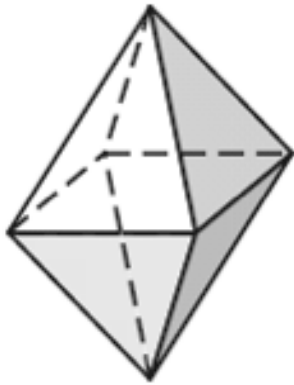
10 e.

$$6 + 6 = 10 + 2$$

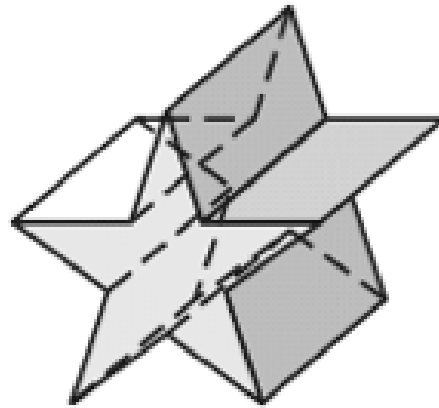
$$12 = 12 \checkmark$$

Convex or Concave?

Describe the polyhedron as *convex* or *concave*?



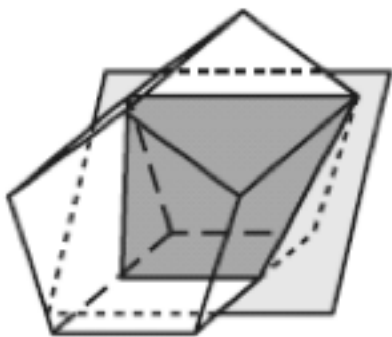
Convex



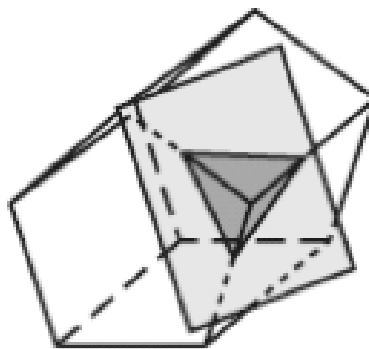
Concave

Conic Sections

Describe the cross section formed by the intersection of the plane and the pentagonal prism.



Trapezoid



Triangle

Homework Assignment

Worksheet 12.1B

