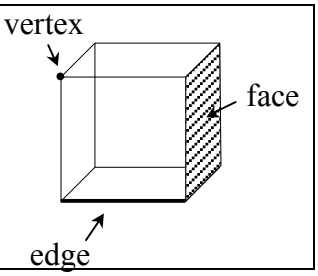
ATTRIBUTES OF POLYHEDRA

POLYHEDRA

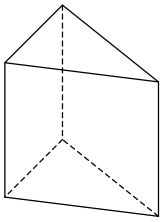
A closed three-dimensional solid that has flat, polygonal faces is called a **polyhedron**. The plural of polyhedron is **polyhedra**. Polyhedra are described by their vertices, edges, and faces as illustrated in the cube at right.



Example

For this polyhedron tell the number of vertices, edges, and faces. Also determine the geometric name of the faces and if any of the faces are parallel.

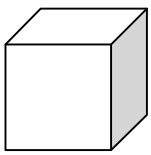
The figure is made up of two triangles and three rectangles so there are five faces. There are six vertices--three on the "top" and three on the "bottom." There are nine edges--three on the "top," three on the "sides," and three on the "bottom." The "top" and "bottom" triangular faces are parallel.



Problems

For each polyhedra, tell the number of vertices, edges, and faces. Also determine the geometric name of the faces and if any of the faces are parallel.

1.



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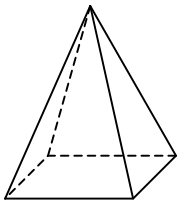

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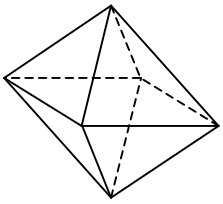

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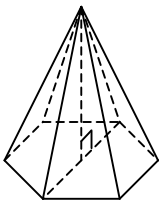

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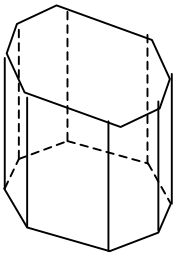

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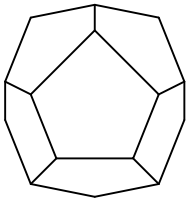

(top and bottom view)

Answers

1. 6 faces, 8 vertices, 12 edges. Faces are rectangles or squares and opposite faces are parallel.

2. 5 faces, 5 vertices, 8 edges. Faces are one square and four triangles. No parallel faces.

3. 8 faces, 6 vertices, 12 edges. Faces are eight triangles. No parallel faces.

4. 7 faces, 7 vertices, 12 edges. Faces are six triangles and a hexagon. No parallel faces.

5. 10 faces, 16 vertices, 24 edges. Faces are two octagons and eight rectangles. Octagons are parallel and if it is a regular octagon, then the opposite rectangles are also parallel.

6. 12 faces, 20 vertices, 30 edges. Faces are all pentagons. Opposite faces are parallel