11.6 Polyhedron Faces, Edges, and Vertices

▶ **GOAL: Determine how the number of faces, edges, and vertices of a polyhedron are related.**

1. A polyhedron has 6 faces and 4 vertices. Use Euler's formula to calculate the number of edges.

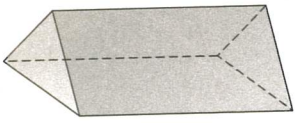
2. A polyhedron has 12 vertices and 22 edges. Use Euler's formula to calculate the number of faces.

At-Home Help

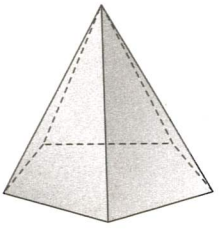
The number of faces, edges, and vertices of a polyhedron are related. **Euler's formula** describes this relationship: $F + V - E = 2$, where F is the number of faces, V is the number of vertices, and E is the number of edges of the polyhedron.

3. Show that Euler's formula works for each polyhedron.

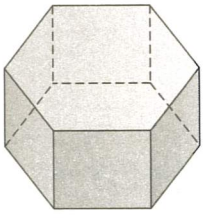
a)



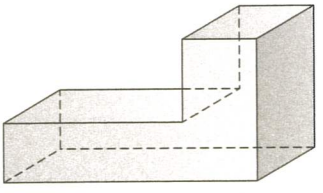
c)



b)



d)



4. Tran says he is building a polyhedron with 5 vertices, 14 edges, and 11 faces. Benjamin says, "That's not possible." Who is correct? Why?

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