

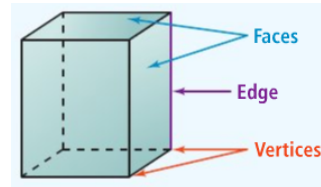
Lesson 11.1 Space Figures & Cross Sections

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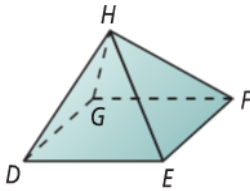
The tissue box at the right is a rectangular solid. Let x = the number of corners, y = the number of flat surfaces, and z = the number of folded creases. What is an equation that relates the quantities x , y , and z for a rectangular solid? Will your equation hold true for a cube? A solid with a triangular top and bottom? Explain.



A polyhedron is a space figure, or three-dimensional figure, whose surfaces are polygons. Each polygon is a face of the polyhedron. An edge is a segment that is formed by the intersection of two faces. A vertex is a point where three or more edges intersect.



How many vertices, edges, and faces are in the polyhedron below? List them.



1 How many vertices are in the polyhedron?

2 How many edges are in the polyhedron?

3 How many faces are in the polyhedron?

4 Is TV an edge?

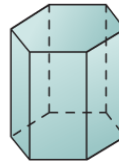
Yes

No

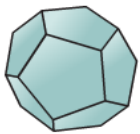
Euler's Formula: The sum of the number of faces (F) and vertices (V) of a polyhedron is two more than the number of its edges (E).

$$F + V = E + 2$$

Ex. How many vertices, edges, and faces does the polyhedron below have? Use the above formula to help.

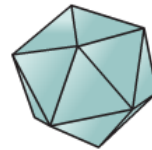


5 Use Euler's Formula to find the missing number.



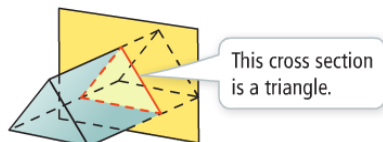
faces: ■
edges: 30
vertices: 20

6 Use Euler's Formula to find the missing number.

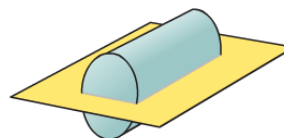


faces: 20
edges: ■
vertices: 12

A cross section is the intersection of a solid and a plane. You can think of a cross section as a very thin slice of the solid.



What is the cross section formed by the plane and the solid below? (hint: keep in mind that the intersection of two planes is a straight line)



- 7 For the solid below, what is the cross section formed by a horizontal plane?



- 8 For the solid below, what is the cross section formed by a vertical plane that divides the solid in half?

