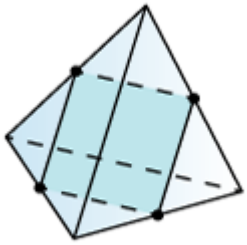
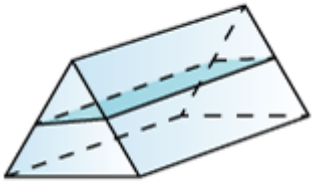
11. Philip misstated Euler's Formula. The formula should be $F + V = E + 2$. The polyhedron has 30 vertices.

12. Yes; the plane can intersect the midpoints of four edges as shown to form a cross section with four sides.



13. Yes; a plane parallel to one of the sides will create a rectangle cross section.



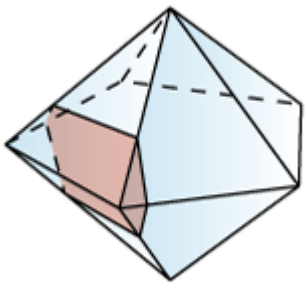
16. 14

17. 30

18. 9

19. 8

20. Hexagon;



21. a square

22. an isosceles triangle

23. a cylinder

24. a cylinder with a cone on top

25. a sphere

26. $1,800$ in.

27. 12 faces, 14 vertices, 24 edges

28. The revolving door is a pair of intersecting rectangles rotating about their line of intersection. The mat will be a circle.

29.

Polyhedron	**Faces (F)**	**Vertices (V)**	**Edges (E)**
regular dodecahedron	12	**20**	30
heptagonal pyramid	8	9	**15**
octahedron	8	**6**	12
rhombohedron	**6**	8	12

30. (B) pentagon