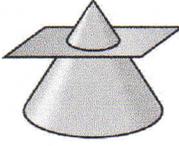
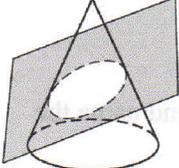


## Representations of Three Dimensional Figures

**Cross Sections** The intersection of a solid and a plane is called a **cross section** of the solid. The shape of a cross section depends upon the angle of the plane.

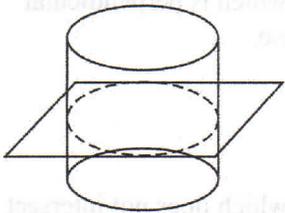
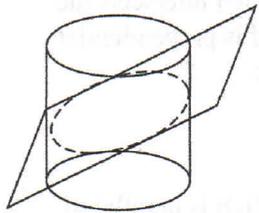
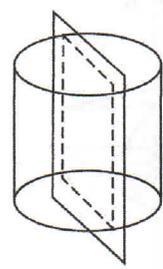
### Example

There are several interesting shapes that are cross sections of a cone. Determine the shape resulting from each cross section of the cone.

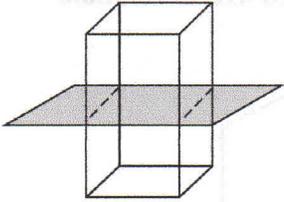
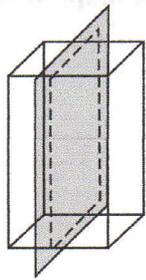
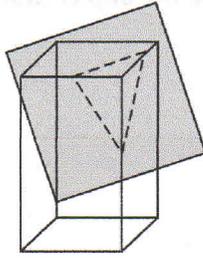
- |    |  |   |  |
|----|--|---|--|
| a. |   | If the plane is parallel to the base of the cone, then the resulting cross section will be a circle.  |   |
| b. |   | If the plane cuts through the cone perpendicular to the base and through the center of the cone, then the resulting cross section will be a triangle. |   |
| c. |  | If the plane cuts across the entire cone, then the resulting cross section will be an ellipse.  |  |

### Exercises

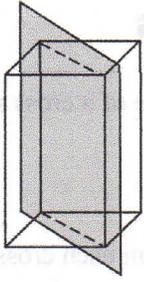
Sketch and name each cross section.

- |    |   |    |   |    |   |
|----|---|----|---|----|---|
| 1. |  | 2. |  | 3. |  |
|----|---|----|---|----|---|

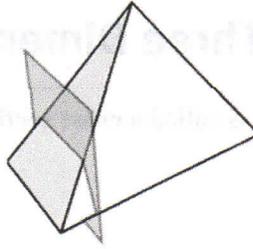
Sketch and name each cross section.

- |    |   |    |   |    |   |
|----|---|----|---|----|---|
| 4. |  | 5. |  | 6. |  |
|----|---|----|---|----|---|

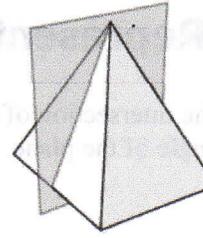
7.



8.



9.

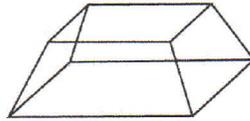


Sketch and name the cross section from a vertical slice of each figure.

10.



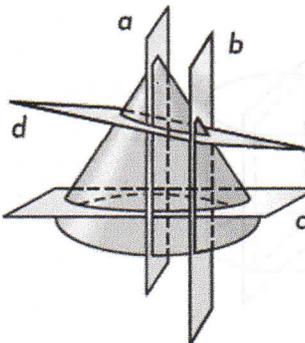
11.



12. Consider the sphere in number 10. Based on the cross section resulting from a horizontal and a vertical slice of the sphere, make a conjecture about all spherical cross sections.

13. LABELS Jamal removes the label from a cylindrical soup can to earn points for his school. Sketch and name the shape of the label.

Sketch the intersection of each of the following planes with the cone below. Name or describe the cross section.



14. Plane a, which intersects the vertex, and is perpendicular to the base.

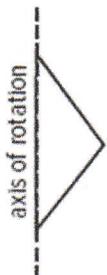
15. Plane b, which is perpendicular to the base.

16. Plane c, which is parallel to the base.

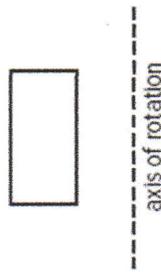
17. Plane d, which does not intersect the base and is not parallel to the base.

Sketch and describe the object that is created by rotating each shape around the indicated axis of rotation.

18.



19.



20.

