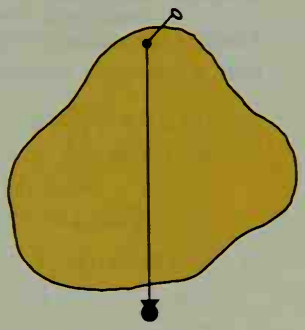
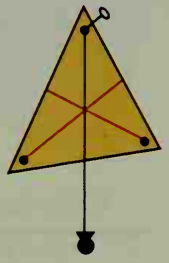
## Exercises



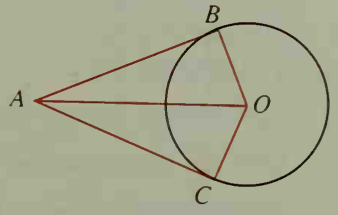
1. For this experiment, cut out a large, irregularly shaped piece of cardboard.
   - **a.** Near the edge, poke a hole just large enough to allow the cardboard to rotate freely when pinned through the hole.
   - **b.** Pin the cardboard through the hole to a suitable wall surface. The piece of cardboard will position itself so that its center of gravity is as low as possible. This means that it will lie on a vertical line through the point of suspension. To find this line, tie a weighted string to the pin. Then draw on the cardboard the line determined by the string.
   - **c.** Repeat parts (a) and (b) but use a different hole. The center of gravity of the cardboard ought to lie on both of the lines you have drawn and should therefore be their point of intersection. The cardboard should balance if supported at this point.



2. Cut out a piece of cardboard in the shape of a large scalene triangle.
   - **a.** Follow the steps of Exercise 1 using three holes, one near each of the three vertices.
   - **b.** If you worked carefully, all three lines drawn intersect in one point, the center of gravity of the cardboard. This point is also referred to as the *center of mass* or the *centroid* of the cardboard. Study the lines you have drawn and explain why in geometry the point of intersection of the medians of a triangle is called the *centroid of the triangle*.
3. Do you think that the center of gravity of a parallelogram is the point where the diagonals intersect? Use the technique of Exercise 1 to test this idea.

## Mixed Review Exercises

**$\overline{AB}$ is tangent to $\odot O$ at $B$. Complete.**




1. If the radius of $\odot O$ is 5 and $AO = 13$, then $AB =$ ___?___.
2. If $m\angle ACO = 90$ and $AB = 10$, then $\overline{AC}$ is ___?___ to $\odot O$ at $C$ and $AC =$ ___?___.
3. A triangle circumscribed about a circle intersects the circle in how many points?
4. Quad. $QRST$ is inscribed in a circle. If $m\angle Q = 39$, find $m\angle S$.