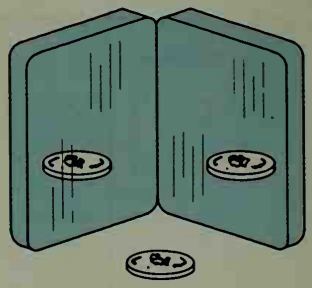
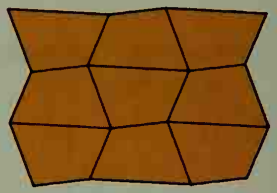
24. If you use tape to hinge together two pocket mirrors as shown and place the mirrors at a 120° angle, then a coin placed between the mirrors will be reflected, giving a pattern with 120° and 240° rotational symmetry.



a. What kinds of symmetries occur when the mirrors are at a right angle?

b. Experiment by forming various angles with two mirrors. Be sure to try 60°, 45°, and 30° angles. Record the number of coins you see, including the actual coin.

25. You can make a tessellation by tracing around *any* quadrilateral, placing copies of the quadrilateral systematically as shown.



a. The tessellation shown has many symmetry points but none of these are at vertices of the quadrilateral. Where are they?

b. What other kind of symmetry does this mosaic have?

26. A figure has 60° rotational symmetry. What other rotational symmetries *must* it have? Explain your answer.

C **27.** Show that if a hexagon has point symmetry, then its opposite sides must be parallel.

28. A figure has 50° rotational symmetry. What other rotational symmetries *must* it have? Explain your answer.

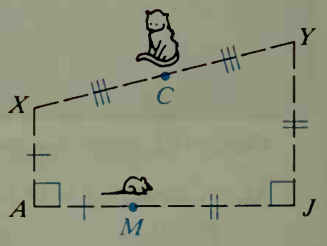
★ **29.** Tell how many planes of symmetry and axes of rotation each solid has.

a. a right circular cone **b.** a cube

c. a regular tetrahedron (a pyramid formed by four equilateral triangles)

Challenges

1. A mouse moves along $\overline{AJ}$. For any position M of the mouse, X and Y are such that $\overline{AX} \perp \overline{AJ}$ with $AX = AM$, and $\overline{JY} \perp \overline{AJ}$ with $JY = JM$. The cat is at C, the midpoint of $\overline{XY}$. Describe the locus of the cat as the mouse moves from A to J.



2. Points O, A, B, and C lie on a number line with coordinates 0, 8, 12, and 26. Take any point P not on the line. Draw $\overline{PA}$ and label its midpoint Q. Draw $\overline{QB}$ and label its midpoint R. Draw $\overline{PC}$ and label its midpoint S. Draw $\overrightarrow{SR}$. What is the coordinate of the point where $\overrightarrow{SR}$ intersects the number line?