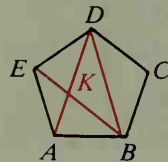**In Exercises 33 and 34 write a paragraph proof for anything you are asked to prove.**
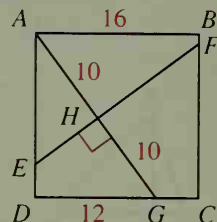
33. Given: Regular pentagon $ABCDE$
    a. Make a large copy of the diagram.
    b. Write the angle measures on your diagram.
   c. Prove that $\dfrac{DA}{DK} = \dfrac{DK}{AK}$.

★ 34. $ABCD$ is a square.
    a. Find the distance from H to each side of the square.
    b. Find BF, FC, CG, DE, EA, EH, and HF.

★ 35. Related to any doubly convex lens there is a focal distance OF. Physicists have determined experimentally that a vertical lens, a vertical object $\overline{JT}$ (with $\overline{JO}$ horizontal), a vertical image $\overline{IM}$, and a focus F are related as shown in the diagram. Once the relationship is known, geometry can be used to establish a lens law:
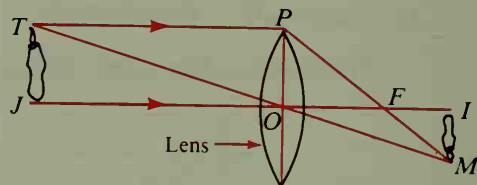
$$\frac{1}{\text{object distance}} + \frac{1}{\text{image distance}} = \frac{1}{\text{focal distance}}$$

a. Prove that $\dfrac{1}{OJ} + \dfrac{1}{OI} = \dfrac{1}{OF}$.   b. Show algebraically that $OF = \dfrac{OJ \cdot OI}{OJ + OI}$.

Challenges

1. Explain how to pass a plane through a cube so that the intersection is:
   a. an equilateral triangle
   b. a trapezoid
   c. a pentagon
   d. a hexagon

2. The six edges of the three-dimensional figure are congruent. Each of the four corners is cut off by a plane that passes through the midpoints of the three edges that intersect at that corner. For example, corner A is cut off by plane MNT. Describe the three-dimensional figure that remains.