



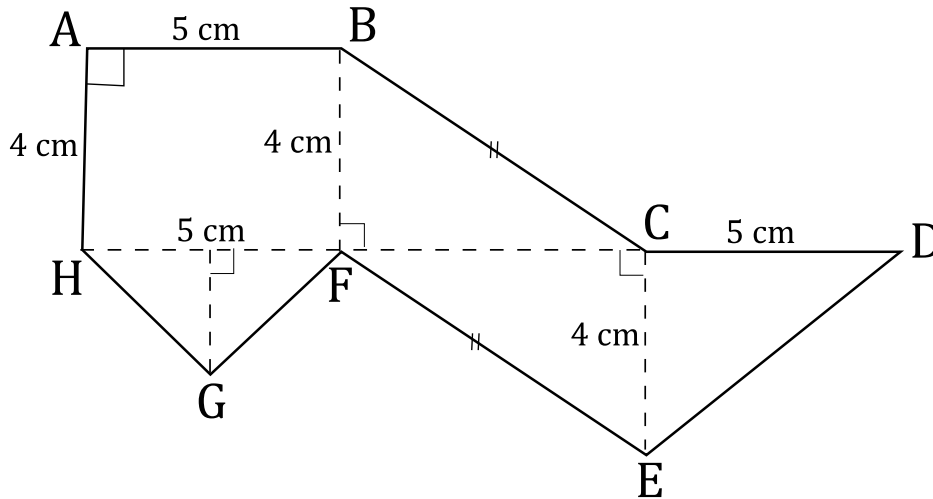
Problem of the Week Problem B A Dimension of Irregularity

Problem

You are given the following distances between the vertices of the irregular polygon in the diagram below.

$$AH = BF = CE = 4 \text{ cm, and } AB = HF = CD = 5 \text{ cm}$$

In addition, you are told that the sides BC and FE are equal in length, and the points H , F , C , and D lie on the same straight line.



- Describe how you would find the area of this irregular polygon. Include a description of what other measurements you would need in order to find the area.
- Make a geometric pattern with four copies of this polygon, using rotations and/or reflections. Colour your pattern in a way that pleases you.

Solution

- Using the given information shown on the diagram above, we can find the area of this polygon by adding the areas of its parts.

Clearly we have enough information to find the areas of the rectangle $ABFH$ ($5 \times 4 = 20 \text{ cm}^2$), and the triangle CDE ($5 \times 4 \div 2 = 10 \text{ cm}^2$).

Further, we know that triangle BFC is congruent to triangle FCE , since they have three sides with the same lengths. Also, since HFC is a straight line, the angles BFC and FCE are right angles, so triangles BFC and CDE are right-angled triangles.

To complete the calculation of the total area, we would need to know the length FC in order to find the area of triangles BFC and FCE , and the height of the triangle HFG in order to find the area of triangle HFG .





b) Here are two sample patterns which each use four copies of the given polygon.

