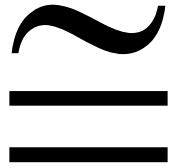


Lesson 9-1: Areas of Two-dimensional Shapes

Hands-on Activity: *Congruent Regions*

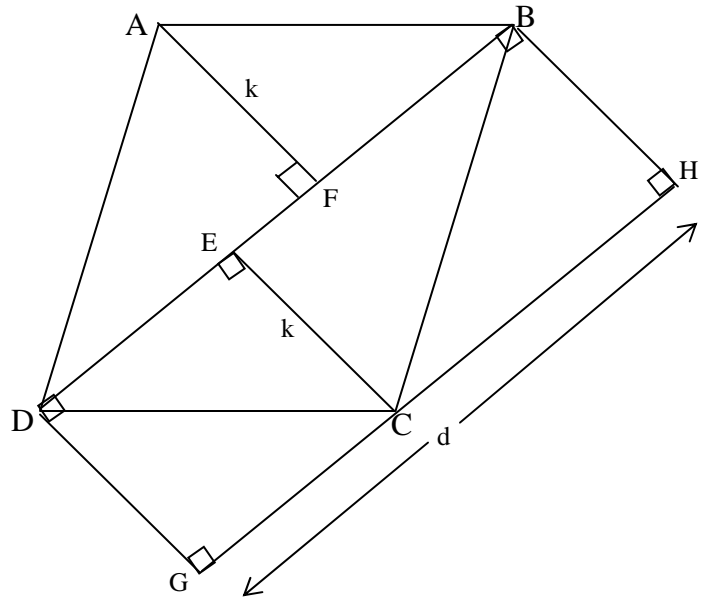
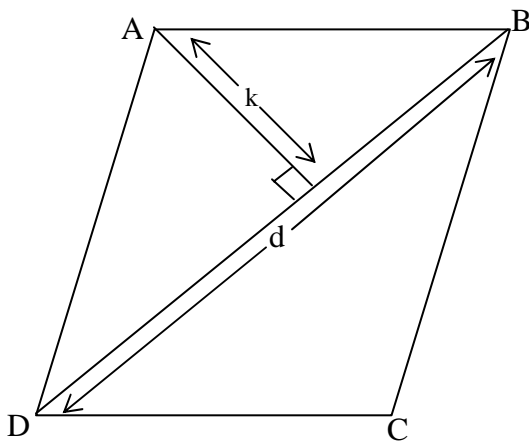


Objective:

We will use the formula for the area of a parallelogram and auxiliary lines forming congruent regions to prove special results.

Procedure:

- On the parallelogram to the right, the diagonal has length d . The segment from A perpendicular to BD has length k .
- On the second congruent parallelogram, note the auxiliary lines drawn. Use your knowledge about perpendicular lines, parallel lines, and congruent triangles to answer the following.



Questions:

1. What kind of figure is $DBHG$?
2. If you moved $\triangle AFB$ to the lower end of figure $DBHG$, would it fit perfectly on top of $\triangle DGC$? Explain your answer.
3. Which two triangular pieces of $\square ABCD$ are congruent to $\triangle CBH$?
4. The area of $\square ABCD$ is the same as that of figure $DBHG$, since the pieces of $\square ABCD$ can be rearranged to form $DBHG$. Express the area of $\square ABCD$ in term of the measurements of k and d .