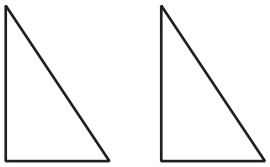
Similarity

Let's explore similar figures.

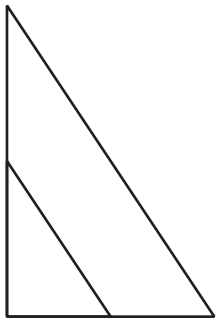
6.1 Which Three Go Together: Triangles

Which 3 go together? Why do they go together?

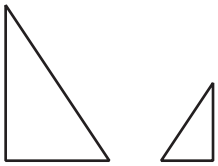
A



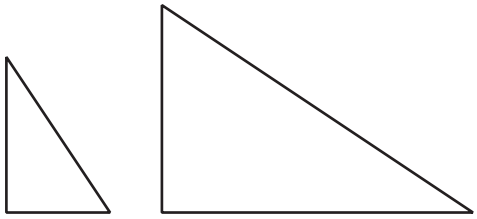
B



C

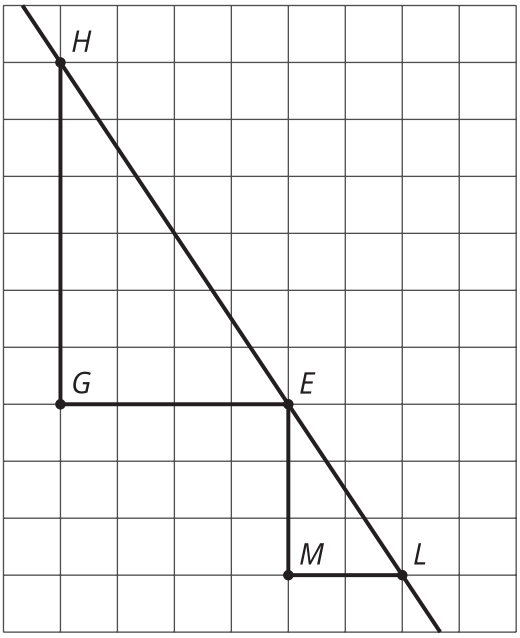


D

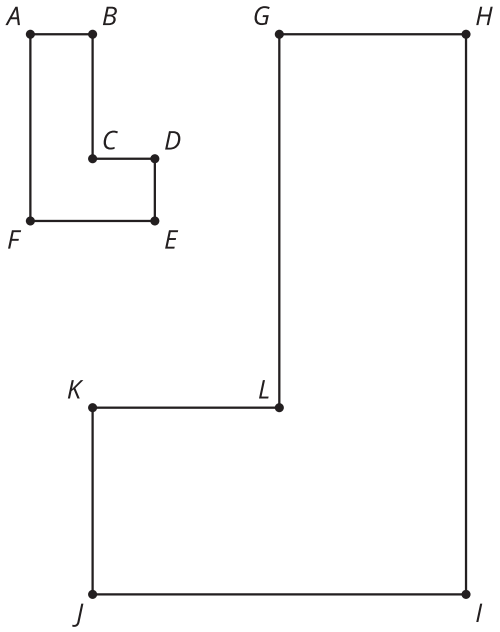


6.2 Similarity Transformations (Part 1)

1. Triangle EGH and triangle LME are **similar**. Find a sequence of translations, rotations, reflections, and dilations that shows this.

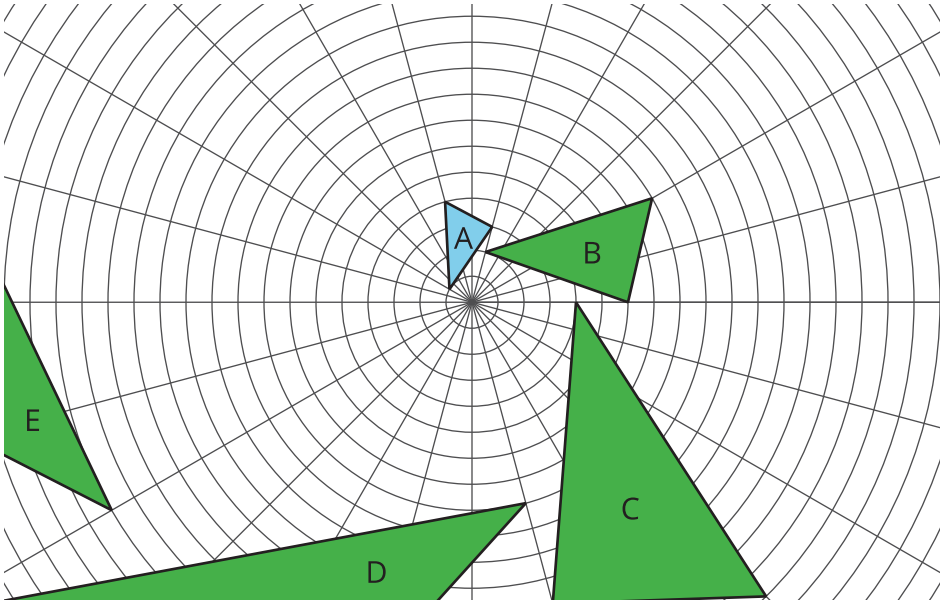


2. Hexagon $ABCDEF$ and hexagon $HGLKJI$ are similar. Find a sequence of translations, rotations, reflections, and dilations that shows this.



Are you ready for more?

The same sequence of transformations that takes Triangle A to Triangle B, also takes Triangle B to Triangle C, and so on. Describe a possible sequence of transformations.



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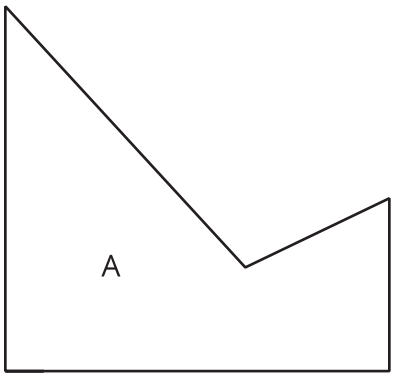
6.3 Similarity Transformations (Part 2)

Sketch figures similar to Figure A that use only the transformations listed to show similarity.



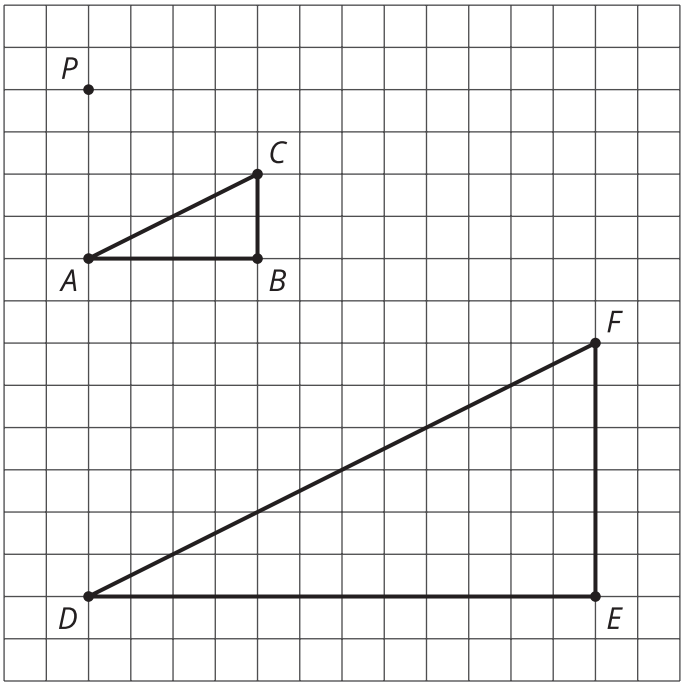
1. A translation and a reflection. Label your sketch Figure B.
   Pause here so your teacher can review your work.
2. A reflection and a dilation with scale factor greater than 1. Label your sketch Figure C.
3. A rotation and a reflection. Label your sketch Figure D.
4. A dilation with scale factor less than 1 and a translation. Label your sketch Figure E.

6.4 Methods for Translations and Dilations

Your teacher will give you and your partner a set of cards. Each set contains five cards for Partner A and a different set of five cards for Partner B.

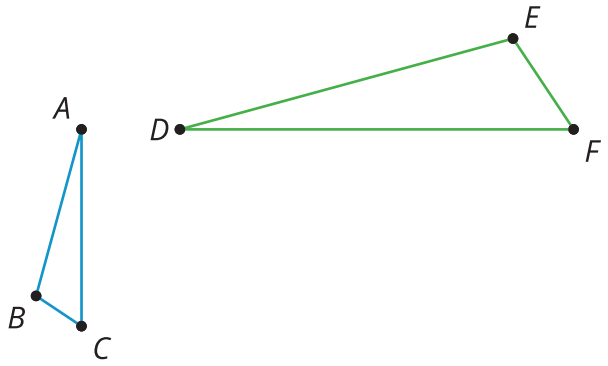
Using only the cards in your set, find one or more ways to show that triangle ABC and triangle DEF are similar.

Compare your method with your partner's method. How are your methods similar? How are they different?



Lesson 6 Summary

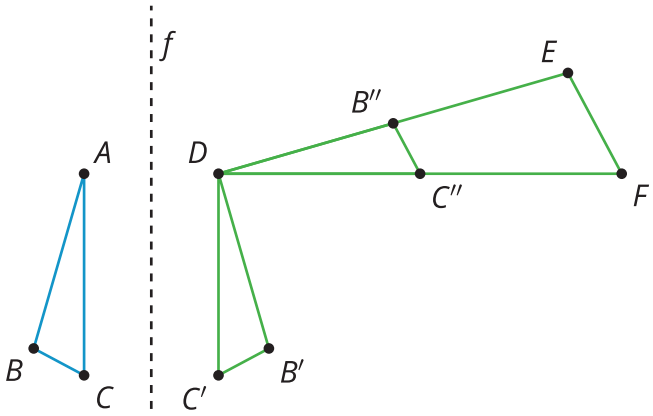
Let's show that triangle ABC is similar to triangle DEF:



Two figures are **similar** if one figure can be transformed into the other by a sequence of translations, rotations, reflections, and dilations. There are many correct sequences of transformations, but we only need to describe one to show that two figures are similar.

One way to get from triangle ABC to triangle DEF follows these steps:

- Reflect triangle ABC across line f
- Rotate 90° counterclockwise around D
- Dilate with center D and scale factor 2



Another way to show that triangle ABC is similar to triangle DEF would be to dilate triangle DEF by a scale factor of $\frac{1}{2}$ with center of dilation at D, then translate D to A, then rotate it 90° clockwise around D, and finally reflect it across the vertical line containing DF so it matches up with triangle ABC.