IM 9–12 MATH v.1

Lesson 2

Congruent Parts, Part 2

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Kendall Hunt

Learning Goal

Let's name figures in ways that help us see the corresponding parts.

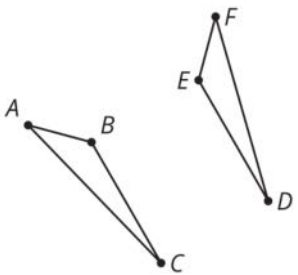## Geometry
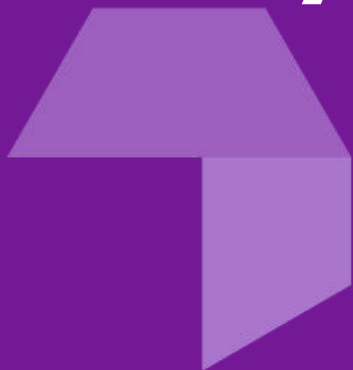
Each pair of figures is congruent. Decide whether each congruence statement is true or false.
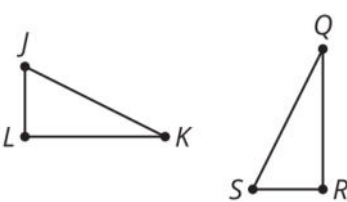
$\triangle ABC \cong \triangle FED$
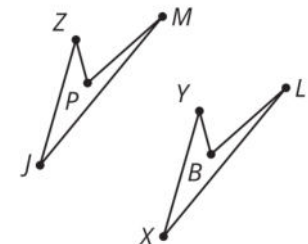
Triangle ABC is congruent to triangle FED.

$PZJM \cong LYXB$

Quadrilateral $PZJM$ is congruent to quadrilateral $LYXB$.

Triangle ABC is congruent to triangle FED.

$\triangle JKL \cong \triangle QRS$

Triangle JKL is congruent to triangle QRS.

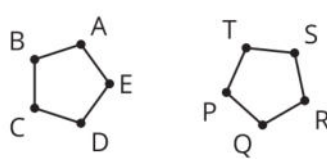Quadrilateral $PZJM$ is congruent to quadrilateral $LYXB$.

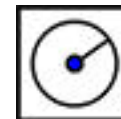$ABCDE \cong PQRST$

Pentagon $ABCDE$ is congruent to pentagon $PQRST$.

To draw a triangle with specified measurements using GeoGebra, open the Geometry App from the Math Tools or go to geogebra.org/geometry.

To begin with a measured angle, first construct a segment or a ray, say *AB*. Choose the Angle-With-Given-Size tool. Click on the point on the ray, point *B*, and then click on the endpoint of the ray, point *A* (which will be the vertex of the angle).
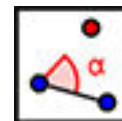
You should see a pop-up window appear. Type the angle measure you need, and choose either clockwise or counter-clockwise. GeoGebra treats the initial ray like the positive -axis of a unit circle or protractor; counter-clockwise is a positive turn, and clockwise is a negative turn. Point *B'* will appear, and segment *AB'* will be congruent to segment *AB*. It is probably simplest to hide *B'* and *AB'*, since *AB* was not a specified length.

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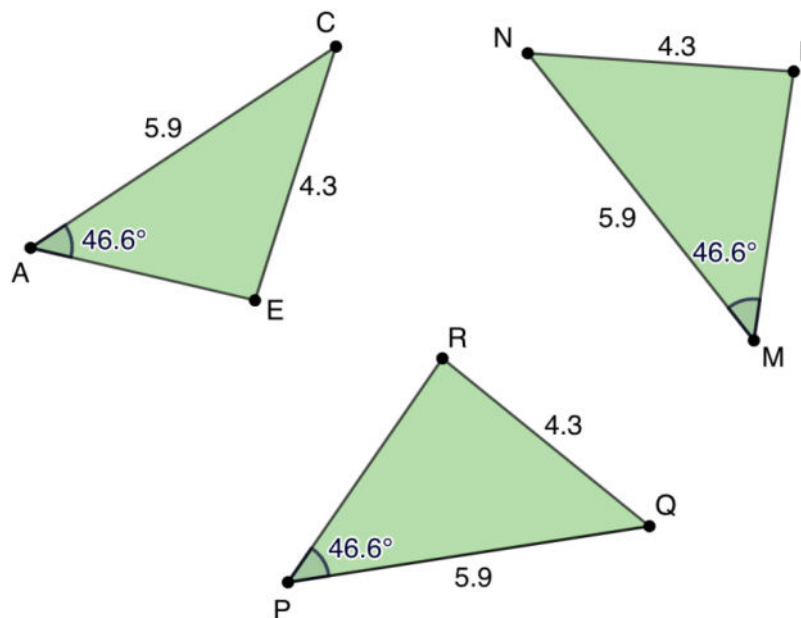
Which Triangles Are Congruent?

To draw a measured side length, mark a distance from a vertex using the Circle-With-Center-and-Radius tool. Click on the vertex, point A, and a pop-up window appears. Enter the given measure as the radius of the circle.

Use the Intersection tool to mark one point of intersection of the angle and the circle. That point is the triangle's second vertex. Continue with the appropriate tools to create more measured sides or angles. See ggbm.at/kaewvwyk for an example.
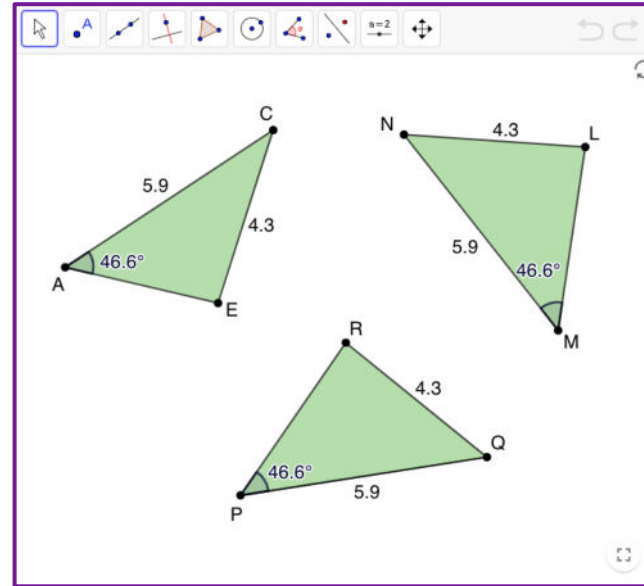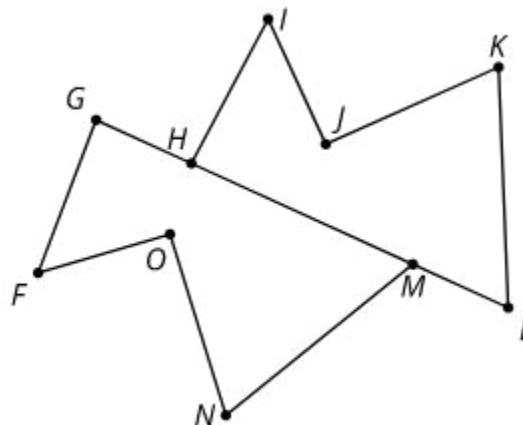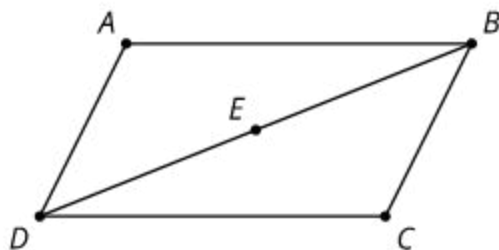
Here are three triangles.

1. Triangle *PQR* is congruent to which triangle? Explain your reasoning.

2. Show a sequence of rigid transformations that takes *PQR* to that triangle. Draw each step of the transformation.

3. Explain why there can't be a rigid transformation to the other triangle.

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1. Triangle *ABD* is a rotation of triangle *CDB* around point *E* by 180°. Is angle *ADB* congruent to angle *CDB*? If so, explain your reasoning. If not, which angle is *ADB* congruent to?

2. Polygon *HIJKL* is a reflection and translation of polygon *GFONM*. Is segment *KJ* congruent to segment *NM*? If so, explain your reasoning. If not, which segment is *NM* congruent to?

3. Quadrilateral *PQRS* is a rotation of polygon *VZYW*. Is angle *QRS* congruent to angle *ZYM*? If so, explain your reasoning. If not, which angle is *QRS* congruent to?

$ABCD \cong JKLM$
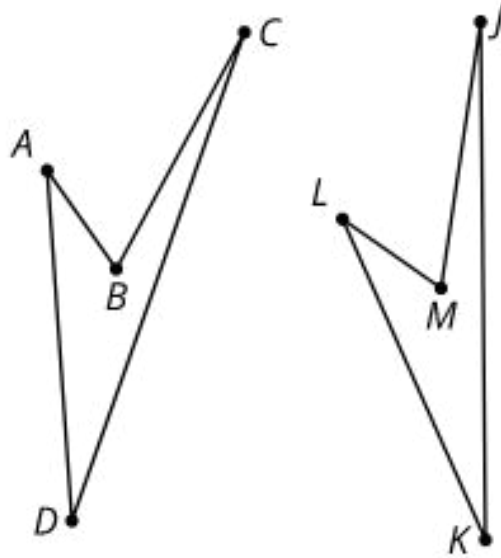
- I can identify corresponding parts from a congruence statement.

- I can use rigid transformations to explain why figures are congruent.
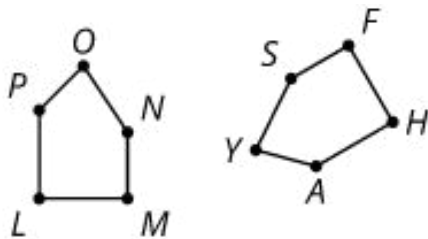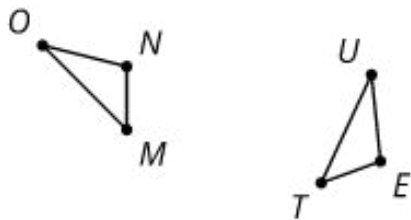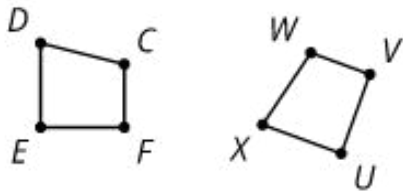
- I can write a congruence statement.

Learning Targets

Geometry

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Write a congruence statement for each pair of congruent figures.

1. .

1. .

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corresponding

For a rigid transformation that takes one figure onto another, a part of the first figure and its image in the second figure are called corresponding parts. We also talk about corresponding parts when we are trying to prove two figures are congruent and set up a correspondence between the parts to see if the parts are congruent.
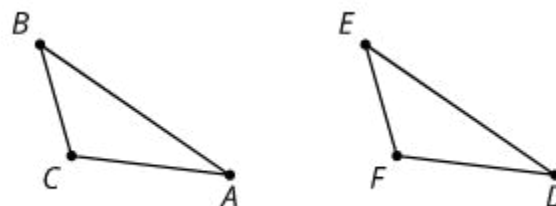
In the figure, segment *AB* corresponds to segment *DE*, and angle *BCA* corresponds to angle *EFD*.

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