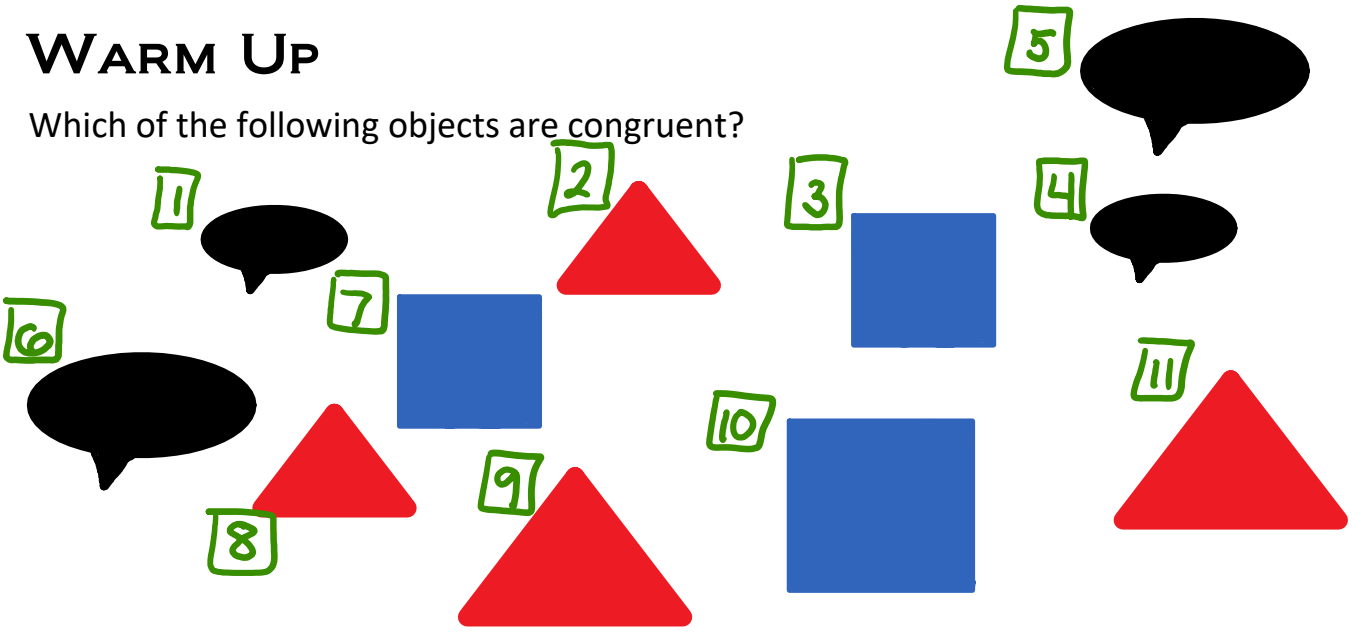
4.1 Congruence

Monday, September 23, 2019 7:46 AM

Warm Up

Which of the following objects are congruent?



Essential Question

What is the relationship between rigid motions and congruence?

Needed Vocab:

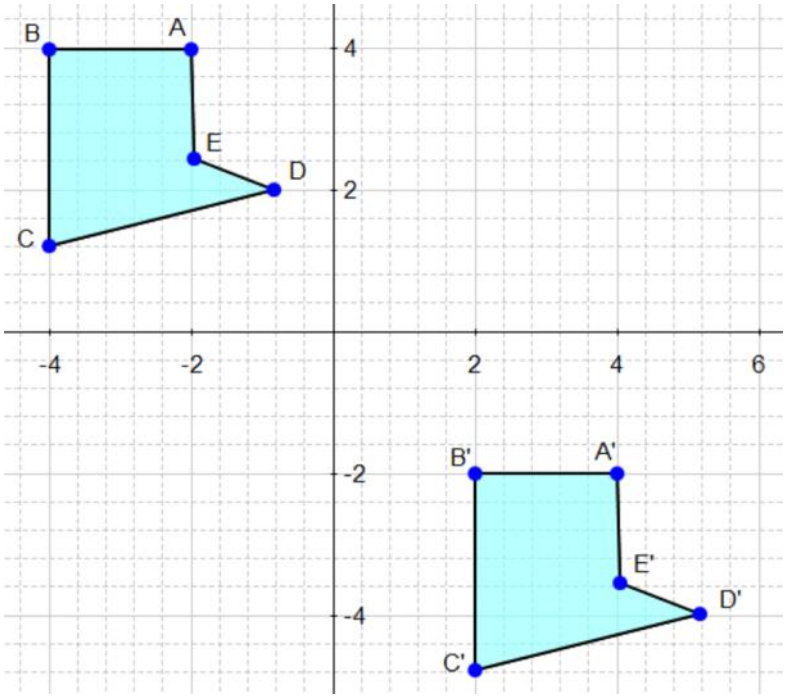
- **Congruence Transformation**
- **Congruent**

Goal: "I can. . .

Use a composition of rigid motions to show that two objects are congruent."

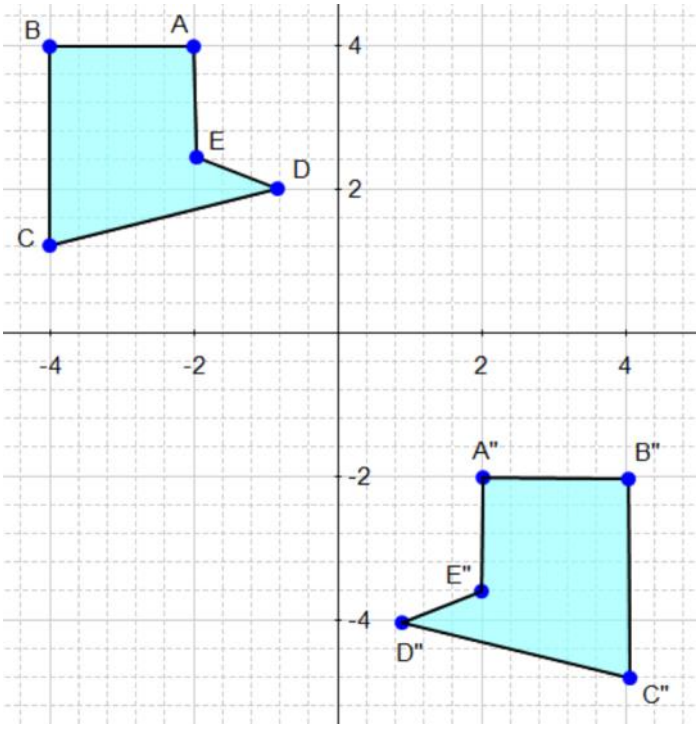
How can we prove with absolutely no doubt that polygon ABCDE is congruent to polygon A'B'C'D'E'?

$T_{\langle 1.5, -4 \rangle}$ maps ABCDE onto A'B'C'D'E' proving congruence.



How can we prove with absolutely no doubt that polygon ABCDE is congruent to polygon A"B"C"D"E"?

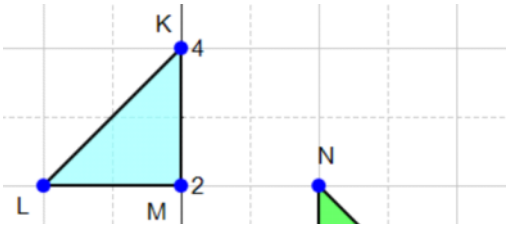
$T_{\langle 0, -6 \rangle} \circ R_{y\text{-axis}}$



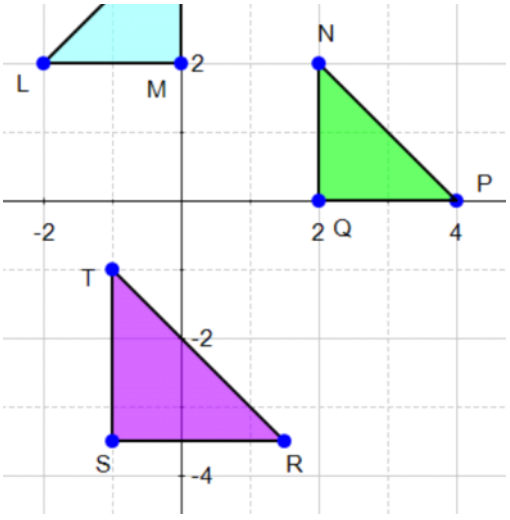
Example 1

Which of the following objects are congruent? Why?

$\triangle KLM \cong \triangle NQP$

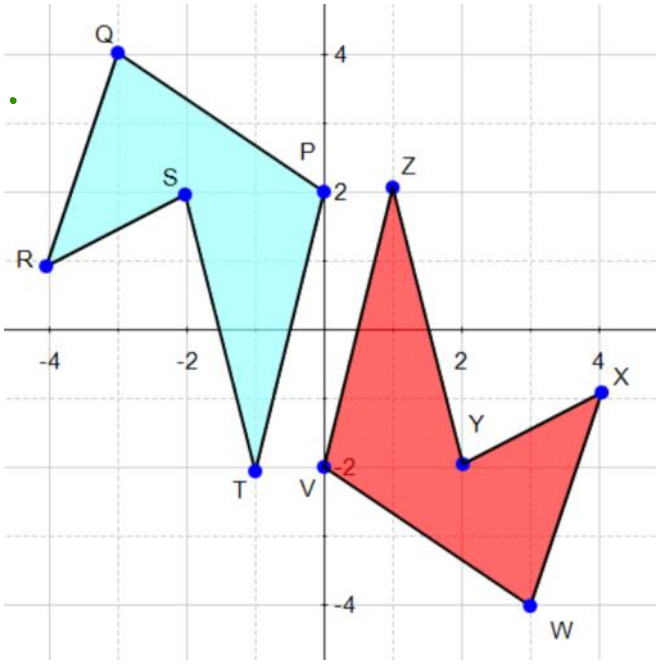


$\triangle KLM \cong \triangle NQP$



Are the following objects congruent and if so how do you know?

Yes, 180° rotation maps it exactly.

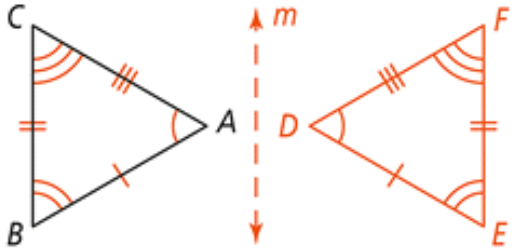


Congruence

Figures that have the same size and shape are said to be *congruent*. Two figures are **congruent** if there is a rigid motion that maps one figure to the other.

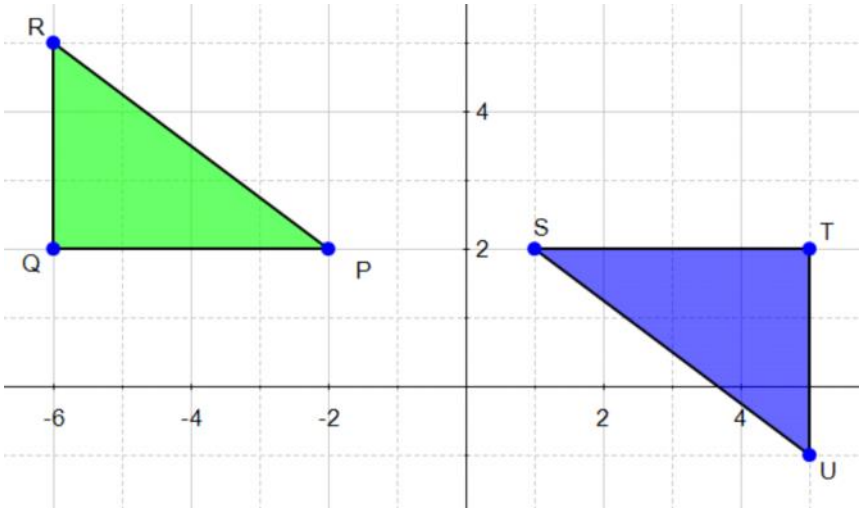
A rigid motion is sometimes called a **congruence transformation** because it maps a figure to a congruent figure.

Use the ≅ symbol to show that two figures are congruent. Since R_m ($\triangle ABC$) = $\triangle DEF$, $\triangle ABC \cong \triangle DEF$.



Example 2

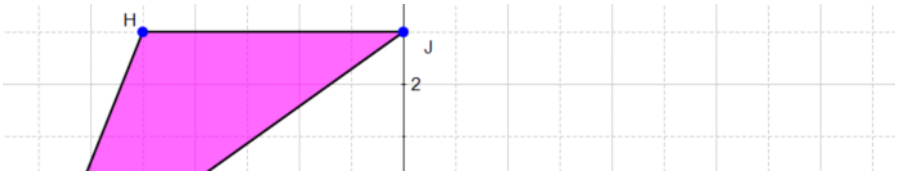
Given that ΔPQR is congruent to ΔUTS, what composition of rigid motions maps ΔPQR to ΔUTS?



$R_{x=-\frac{1}{2}} \circ R_{y=2}$

multiple others.

Use the graph shown.
Given $\Delta GHJ \cong \Delta KLM$, what is one composition of rigid motions that maps ΔGHJ to ΔKLM?

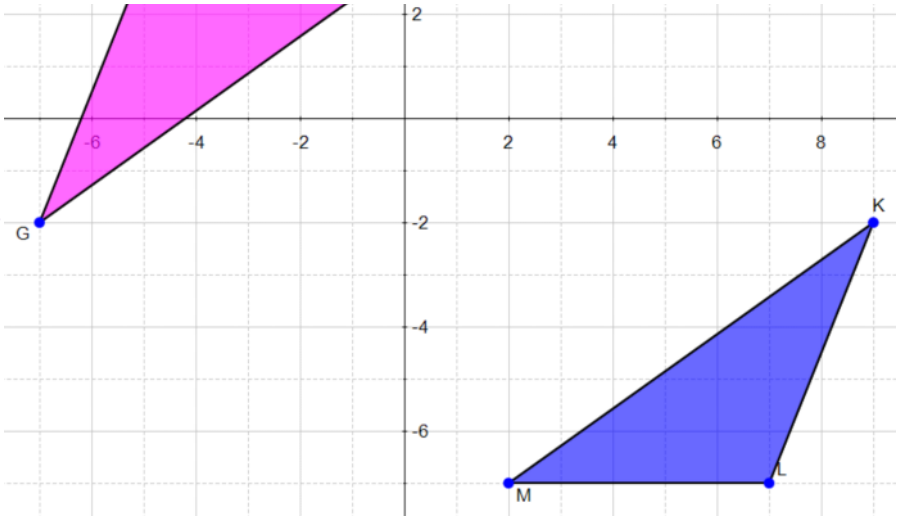


What is another composition that you could use?

What is another composition that you could use?

$T_{\langle 2,8\rangle} \circ R_{y=-2} \circ R_{y\text{-axis}}$

and others...

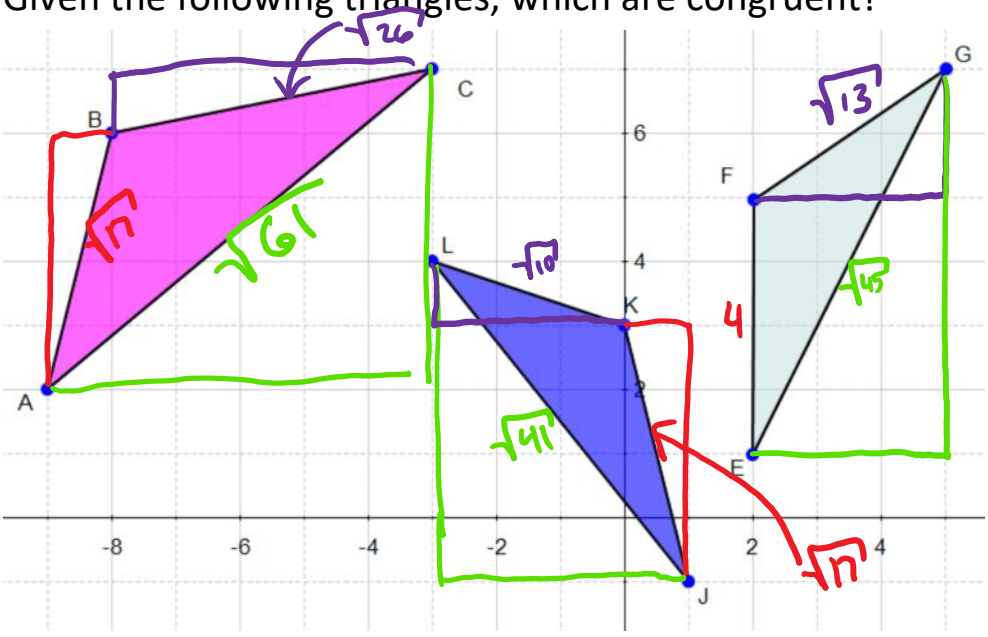


Example 3

Given the following triangles, which are congruent?

None.

No side lengths are the same.



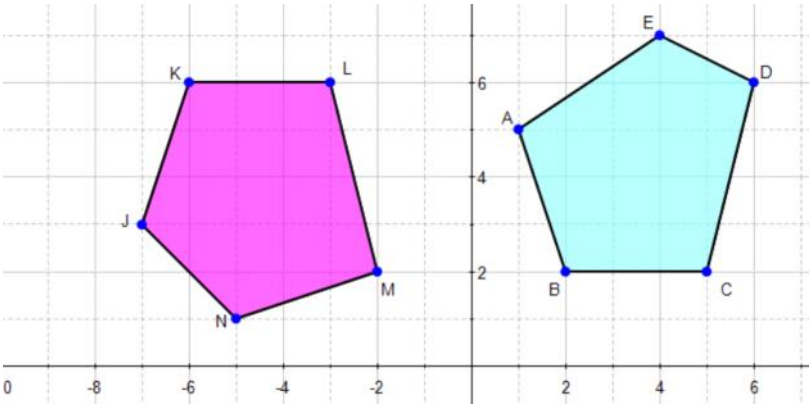
Use the graph shown.

Are ABCDE and JKLMN congruent? If so, describe a composition of rigid motions that maps ABCDE to JKLMN. If not, explain.

not ≅

Are ABCDE and VWXYZ

≅



Are ABCDE and VWXYZ congruent? If so, describe a composition of rigid motions that maps ABCDE to VWXYZ. If not, explain.

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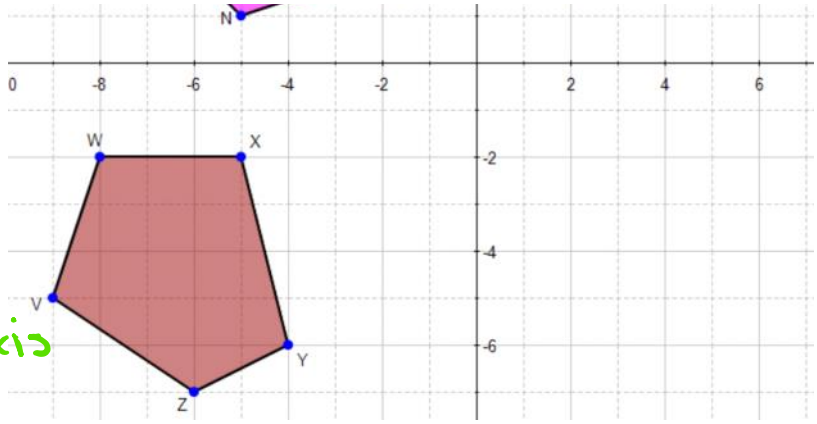
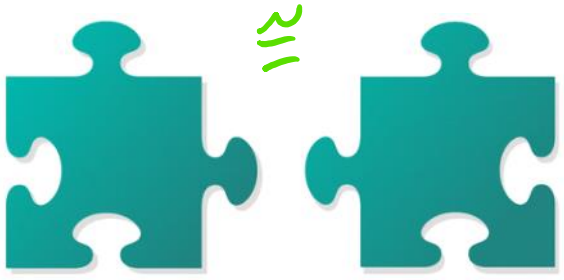
$T_{\langle -10, 0 \rangle} \circ R_{x\text{-axis}}$



Example 4 Is the pair of objects congruent? If the pair of objects is congruent, describe a composition of rigid motions that maps one to the other.



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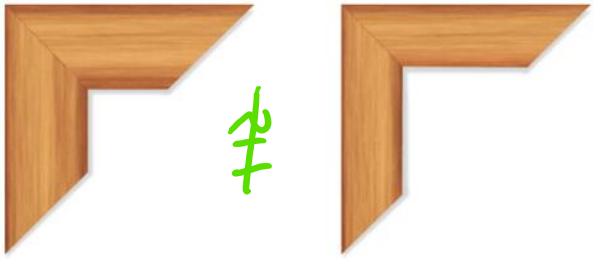

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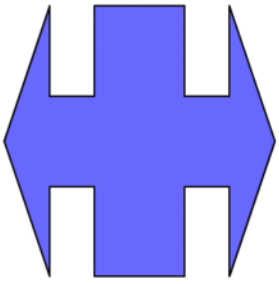
Are the pair of objects congruent? If the pair of objects is congruent, describe a composition of rigid motions that maps one to the other.



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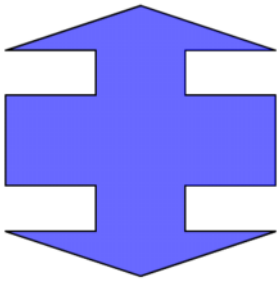
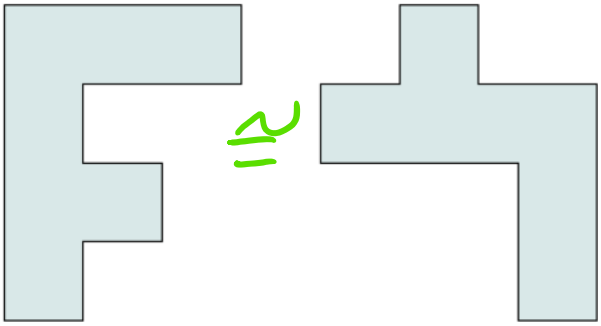
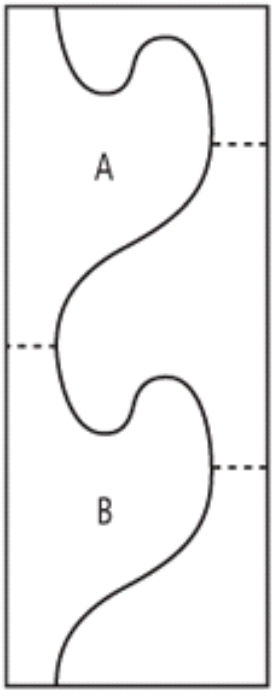


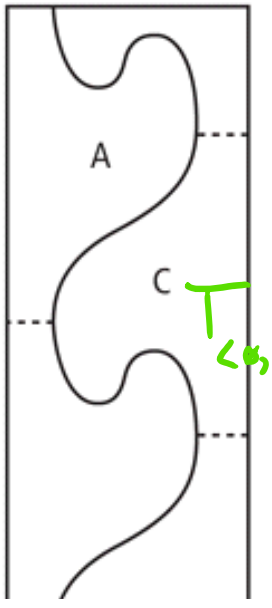


Given Unit A, what composition of rigid motions maps Unit A to Unit B?



$T_{\langle 0, \text{height of A} \rangle}$

Is Unit C congruent to Unit A? if so, describe the composition of rigid motions that maps Unit A to Unit C.

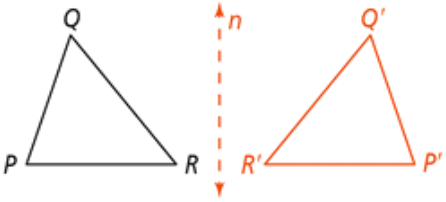


$T_{\langle 0, \text{RAD} \rangle} \circ T_{\langle \text{smallest width of A}, 0 \rangle} \circ R_{(180^\circ, \text{center})}$

Congruent Figures

WORDS If two figures are congruent, a composition of rigid motions maps one figure to another.

DIAGRAM Since $R_n(\triangle PQR) = \triangle P'Q'R'$, $\triangle PQR \cong \triangle P'Q'R'$.



Homework

Pg. 155
10-14 even, 15, 17, 18, 21, 22