# 4-7 Congruency Transformations
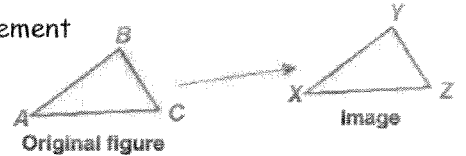
## IDENTIFY CONGRUENCE TRANSFORMATIONS:

A _transformation_ is an operation that maps an original geometric figure, called the _preimage_, onto a new figure called the _image_. A transformation can change the _position_, _size_, or _shape_ of a figure.

❖ We note a transformation by using an arrow. The transformation statement
△ABC → △XYZ tells you that point A is mapped to point _X_,
point B is mapped to point _Y_, and point C is mapped to point _Z_.
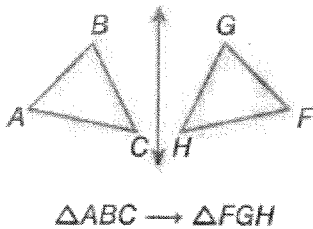
Original figure    Image

❖ A congruency transformation, also called a rigid transformation or an _Isometry_, is one where the position of the image may differ from that of the preimage, but the two figures always remain _≅_.

## THREE TYPES OF CONGRUENCE TRANSFORMATIONS:

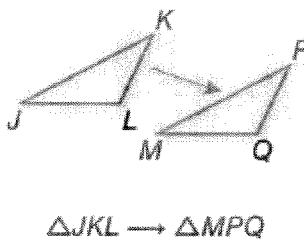A _Reflection_ or _flip_ is a reflection over a line called the _line of reflection ↑_ (axis of (symmetry))

Each point of the pre-image and its image are the same distance from the line of reflection.

Example

△ABC → △FGH

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A _Translation_ or _slide_ is a transformation that moves all points of the original figure the same distance in the same direction.
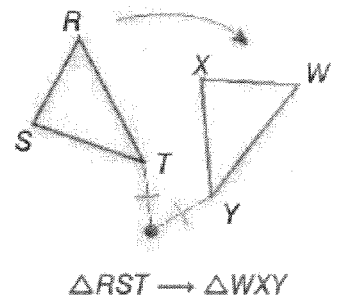
Example

△JKL → △MPQ

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A _Rotation_ or _turn_ is a transformation around a fixed point called the _center of rotation_, through a specific angle, and in a specific direction.

Each point of the pre-image and its image are the _same distance_ from the center.

Example

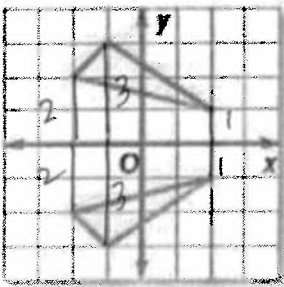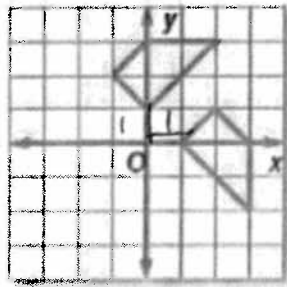△RST → △WXY

**EXAMPLES:** Identify the type of transformation shown as a reflection, translation, or rotation. Verify that it is a congruence transformation.
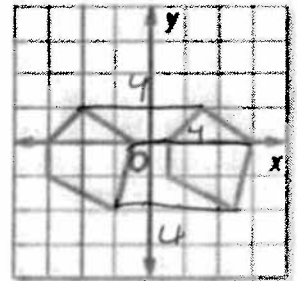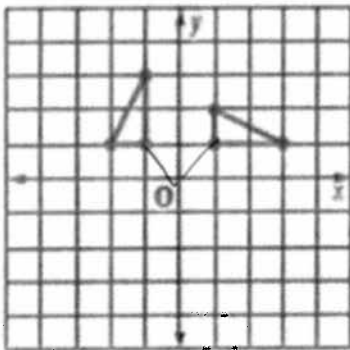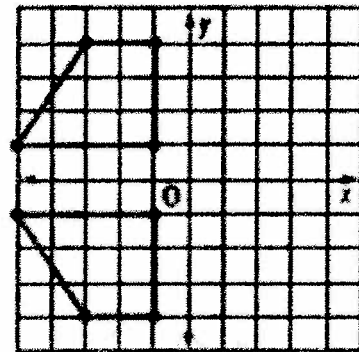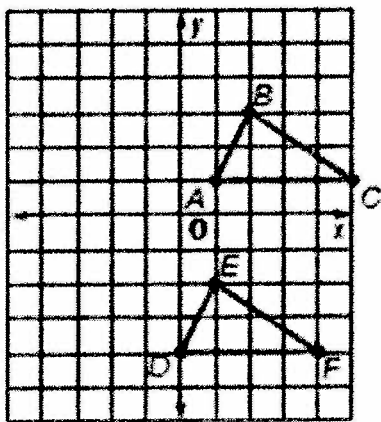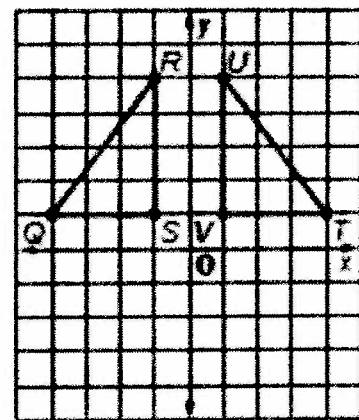
1.

Reflection

2.

Rotation

3.

Translation

4.

Rotation

5.

Reflection

6.

Translation

7.

Reflection