

Geometry Info Sheet #20

Transformations, Congruence, and Similarity

Definitions

Transformation: A function that moves or changes a figure in some way to produce a new figure

Pre-Image: An object or figure before it is transformed

Image: An object or figure after undergoing a transformation

Rigid Transformation: A transformation that does not change the size or the shape of a figure

Dilation: A transformation that changes the size, but not the shape, of a figure; the size of the transformed image may be larger or smaller than the original image

Two figures are **congruent** if and only if there is a rigid motion or a composition of rigid motions that maps one of the figures onto the other. Congruent figures have the same shape and the same size.

Another name for a rigid transformation or a rigid motion is a **congruence transformation**, because in a rigid transformation the pre-image and the image are congruent.

Two figures are **similar** if and only if there is a **similarity transformation** that maps one of the figures onto the other. Similar figures have the same shape, but different sizes.

A **similarity transformation** is a dilation or a composition of dilations and rigid motions, because a dilation is a transformation that changes the size, but not the shape, of a figure.