Entry #: 23

Dilation & Scale Factor

Dilation is a type of transformation.

When a figure is dilated, the shape stays the same, but the sides of the figure get bigger or smaller.

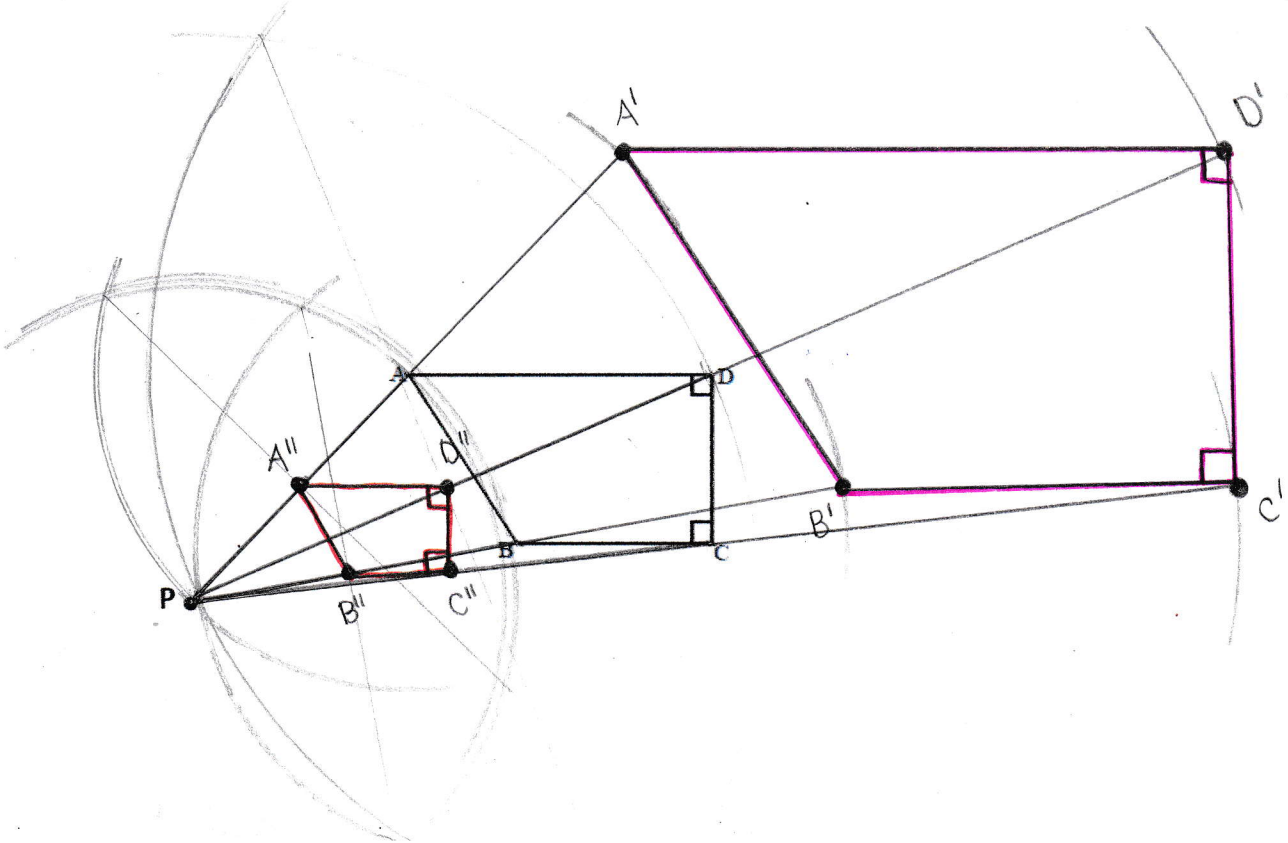
To dilate a figure, you must be given a center of dilation and a scale factor.

A **scale factor** is the number each side of the original figure is being multiplied by to get the newly dilated figure.

If a scale factor is between 0 and 1, then the figure gets smaller.

If a scale factor is greater than 1, then the figure gets bigger.

Example: *Dilate figure ABCD using center of dilation P and a scale factor of 2 and again by a scale factor of $\frac{1}{2}$.*



How to Find the Scale Factor

Given two figures that have been dilated, it is possible to find the scale factor by setting up a ratio between two sides that correspond.

Note:

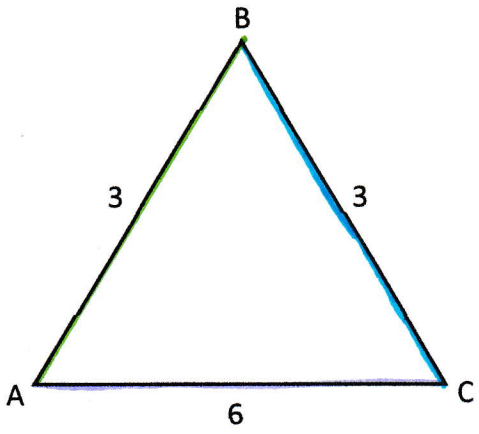
$\frac{\text{big side length}}{\text{small side length}}$ } will make the figure larger

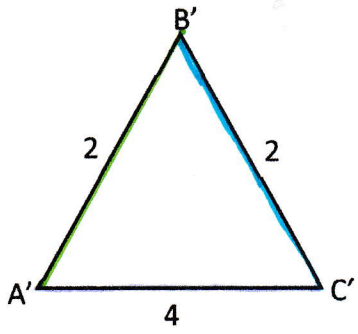
$\frac{\text{small side length}}{\text{big side length}}$ } will make the figure smaller

Reciprocals

Example: $\frac{3}{2}$ vs. $\frac{2}{3}$

Example: Find the scale factor that takes the bigger figure to the smaller figure and the smaller figure to the bigger figure.





Scale Factor $\Delta ABC \rightarrow \Delta A'B'C'$: $\frac{A'B'}{AB} = \frac{2}{3}$ $\frac{A'C'}{AC} = \frac{4}{6} = \frac{2}{3}$ $\frac{B'C'}{BC} = \frac{2}{3}$

Scale Factor: $\frac{2}{3}$

Scale Factor $\Delta A'B'C' \rightarrow \Delta ABC$: $\frac{AB}{A'B'} = \frac{3}{2}$ $\frac{AC}{A'C'} = \frac{6}{4} = \frac{3}{2}$ $\frac{BC}{B'C'} = \frac{3}{2}$

Scale Factor: $\frac{3}{2}$