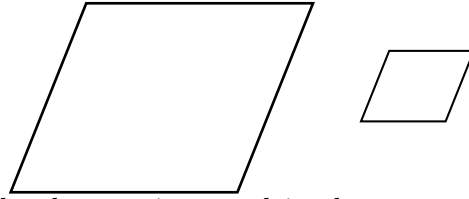


MATH 5: HANDOUT 25
GEOMETRY 5.

SIMILAR FIGURES

Two figures are called *similar* if one of them can be obtained from the other by rescaling, or stretching (equally in all directions).



In similar figures all angles are the same, and all lengths are increased in the same proportion. For example, if triangles ABC and $A'B'C'$ are similar, then

$$\begin{aligned}\angle A &= \angle A', & \angle B &= \angle B', & \angle C &= \angle C' \\ A'B' &= kAB, & A'C' &= kAC, & B'C' &= kBC\end{aligned}$$

The number k is called the similarity coefficient.

SIMILARITY TESTS FOR TRIANGLES

Axiom 1 (AAA Rule). *If three angles of one triangle are equal to corresponding angles of another triangle, then the triangles are similar.*

For example, if ABC , $A'B'C'$ is a right triangles with $\angle C = \angle C' = 90^\circ$, $\angle A = \angle A' = 30^\circ$, then these triangles are similar.

Another example is shown in the figure to the right. Let lines $l = AB$, $l' = A'B'$ be parallel. Then triangles ABC and $A'B'C$ are similar: indeed, by the theorem about alternate angles, we have $\angle A = \angle A'$, $\angle B = \angle B'$.

