

## Similar Triangles College Algebra

If you scale each side of a triangle by  $r$ , as in Figure 1, the triangles are said to be *similar*.

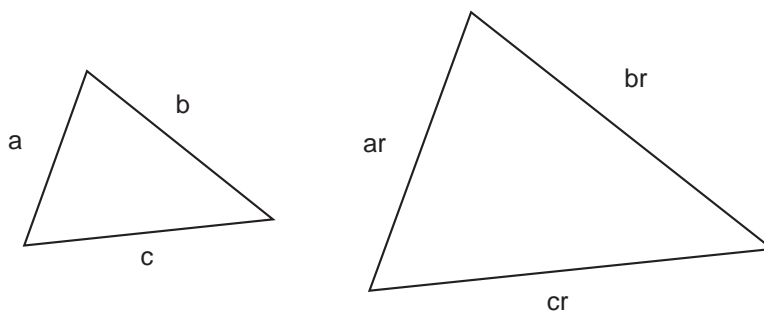


Figure 1. Scaling by  $r$ .

Note that scaling the triangle does not affect the measure of the angles of the triangle. Each angle of the scaled triangle has the same measure as the corresponding angle of the original triangle.

The converse is also true. That is, if each of the angles of a triangle are equal in measure to the corresponding angle of a second triangle, then the triangles are similar and the sides are proportional. For example, in Figure 2,

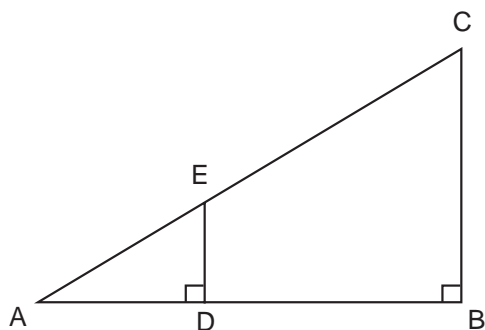


Figure 2. Similar triangles.

angles ADE and ABC are right angles and are equal. Angle DAE is equal to angle BAC (any angle is equal to itself). Since there are  $180^\circ$  in any triangle, the remaining angles of triangle DAE and BAC are equal. That is, angle AED is equal to angle ACB. Therefore, triangles AED and ACB are similar and we may write

$$\frac{AE}{AC} = \frac{AD}{AB} = \frac{DE}{BC}.$$