



Notes:

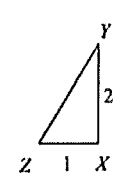
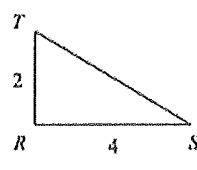
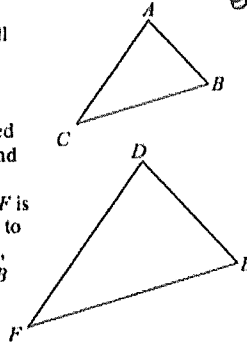
## CORRESPONDING PARTS OF SIMILAR SHAPES

Two figures are **similar** if they have the same shape but not necessarily the same size. For example, all semi-circles are similar, as are all squares, no matter how they are oriented. Dilations create similar figures.

To check whether figures are similar, you need to decide which parts of one figure correspond (match up) to which parts of the other. For example, in the triangles at right, triangle  $DEF$  is a dilation of triangle  $ABC$ . Side  $AB$  is dilated to get side  $DE$ , side  $AC$  is dilated to get side  $DF$ , and side  $BC$  is dilated to get side  $EF$ . Side  $AB$  corresponds to side  $DE$ , that is, they are **corresponding sides**. Notice that vertex  $A$  corresponds to vertex  $D$ ,  $C$  to  $F$ , and  $B$  to  $E$ .

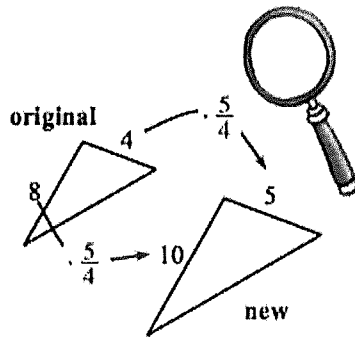
Not all correspondences are so easily seen. Sometimes you have to rotate or reflect the shapes mentally so that you can tell which parts are the corresponding sides, angles, or vertices. For example, the two triangles at right are similar, with  $R$  corresponding to  $X$ ,  $S$  to  $Y$ , and  $T$  to  $Z$ . You can get triangle  $XYZ$  from triangle  $RST$  by a dilation of  $\frac{1}{2}$  followed by a  $90^\circ$  counter-clockwise ( $\curvearrowright$ ) turn.

Shapes that are similar and have the same size are called **congruent**. Congruent shapes have corresponding sides of equal length and corresponding angles of equal measure. Rigid transformations (reflections, rotations, and translations), along with dilations with a multiplier of 1 or -1, create congruent shapes.



## SCALE FACTOR

A **scale factor** is a ratio that describes how two quantities or lengths are related. A scale factor that describes how two similar shapes are related can be found by writing a ratio between any pair of corresponding sides as  $\frac{\text{new}}{\text{original}}$ .



For example, the two similar triangles at right are related by a scale factor of  $\frac{5}{4}$  because the side lengths of the new triangle can be found by multiplying the corresponding side lengths of the original triangle by  $\frac{5}{4}$ .

A scale factor greater than one **enlarges** a shape (makes it larger). A scale factor between zero and one **reduces** a shape (makes it smaller). If a scale factor is equal to one, the two similar shapes are identical and are called **congruent**.

Notes:

A large grid area for taking notes, located on the right side of the page below the 'SCALE FACTOR' section.