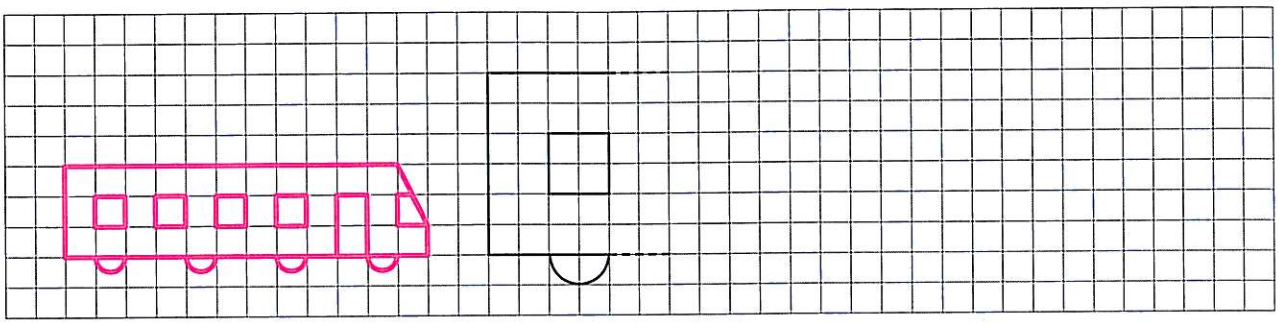
8 SIMILARITY

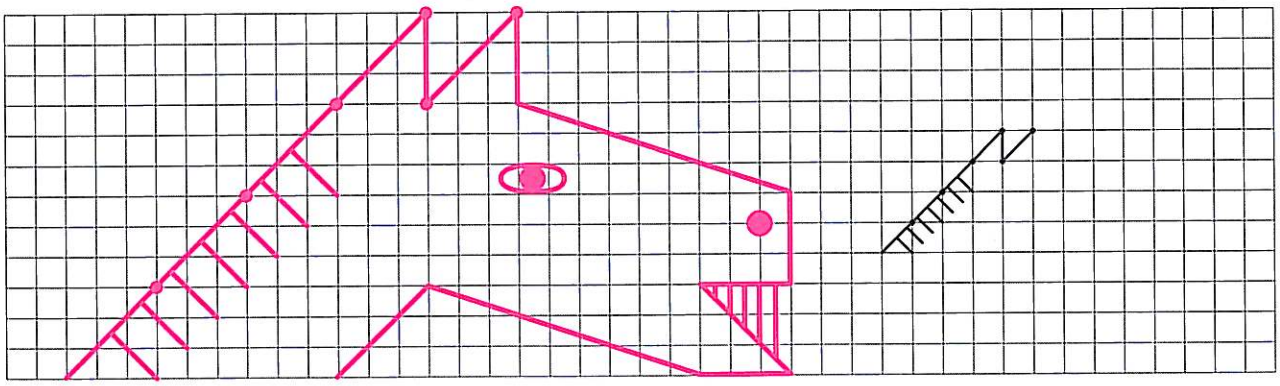
1 ENLARGEMENT AND REDUCTION

1. Enlarge the following shape to double its present size:

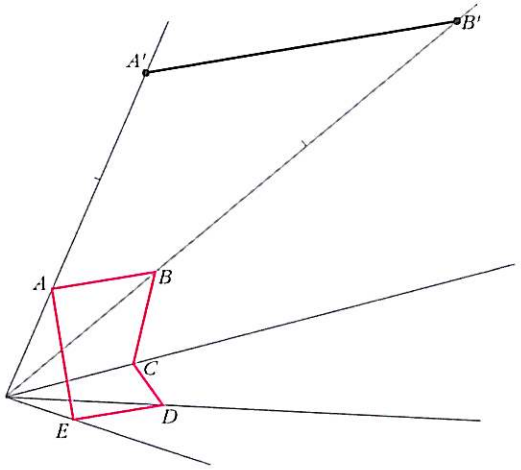


Each line of the shape on the right is twice as long as the corresponding line in the shape on the left.

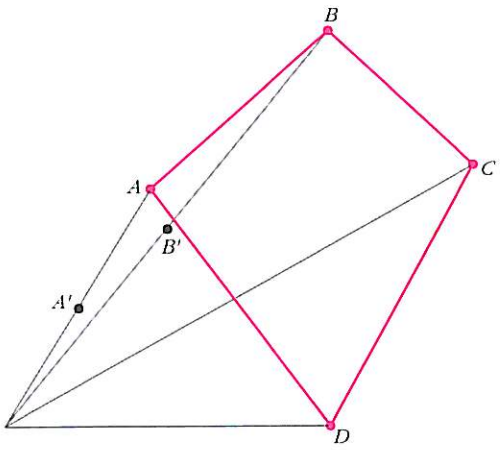
2. Reduce the shape to one-third of its present size.



3. Enlarge the shape to 3 times its present size.



4. Reduce the shape to one-half of its present size.



2 SIMILAR SHAPES

Similar shapes

Two figures are **similar** when they have the **same fundamental shape.**

The lengths of the sides of one shape can be multiplied by the same factor to obtain the lengths of the sides of the other shape. This is called the **similarity ratio.**

EXAMPLES

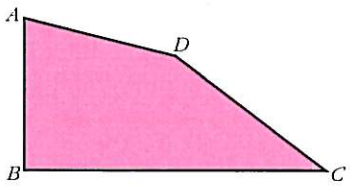
- The buses in exercise 1 on the previous page have the same shape. Each length of the second bus is double the corresponding length of the first bus. They are similar. Their similarity ratio is 2.
- The horses in exercise 2 on the previous page are similar. The similarity ratio of the second horse with respect to the first horse is 1/3.

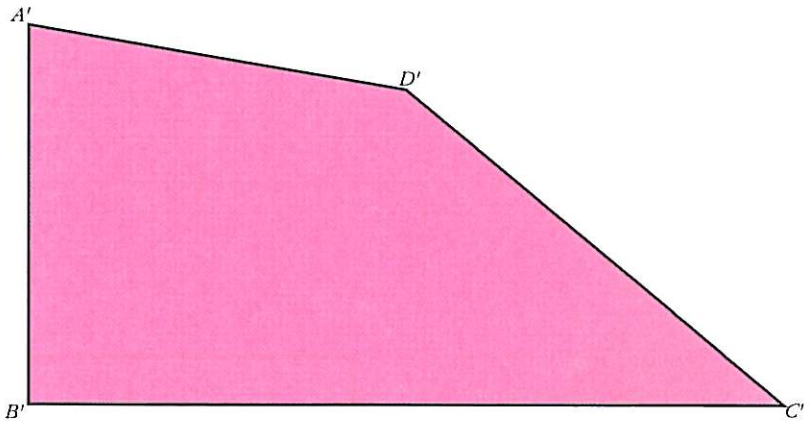
1. In exercise 3 on the previous page, what is the similarity ratio of the shape $A'B'C'D'E'$ with respect to the shape $ABCDE$?

Each segment of the large shape is triple its corresponding segment on the small shape. Therefore, the similarity ratio is...

2. What is the similarity ratio of the small shape with respect to the large shape in exercise 4 on the previous page?

3. These two shapes are similar. Measure and compare their sides. What is the similarity ratio?





The length of side $B'C'$ is 10 cm. The length of side BC is 4 cm.

The quotient (10 : 4 = 2.5) is the similarity ratio.

The same thing can be done with the shape's other sides.

$A'B' =$ $AB =$ $A'B' : AB =$

$A'D' =$ $AD =$ $A'D' : AD =$

4. Take measurements and write down the similarity ratio of the second triangle with respect to the first: