



RATIO
&
SIMILARITY



Lesson 1

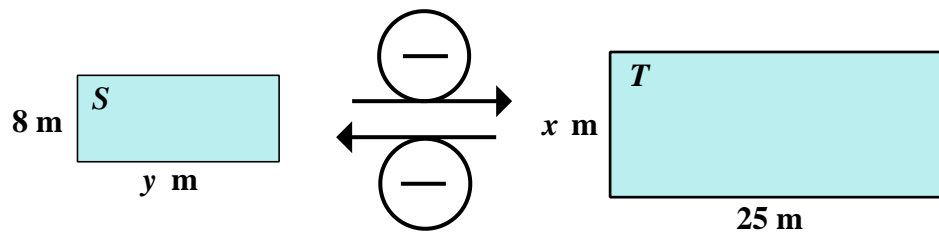
GCSE Mathematics Ratio and Similarity

1.1 Length Scale factor (*lsf*)

◇ Two shapes are similar when one is an enlargement of the other.

Example N° 1

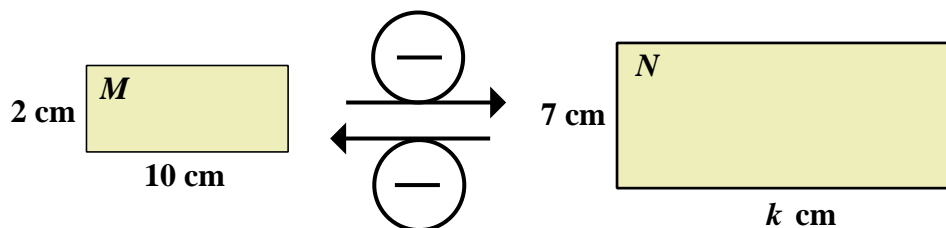
For the similar rectangles *S* and *T*, shown below, find the lengths marked *x* and *y* given that the length scale factor (greater than 1) of the similarity is $\frac{5}{4}$



[2 marks]

Example N° 2

For the similar rectangles *M* and *N*, shown below, find the length scale factor (greater than 1) of the similarity and also the length marked *k*



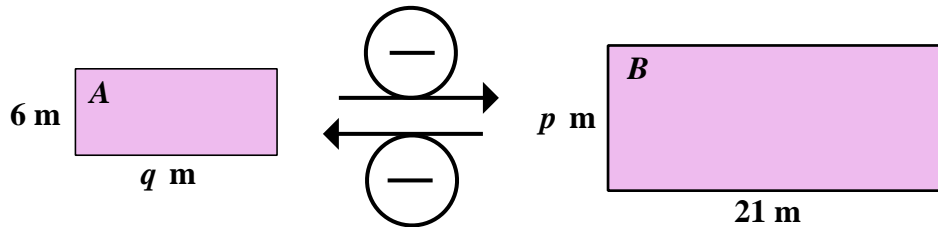
[2 marks]

1.2 Exercise

Marks Available : 32

Question 1

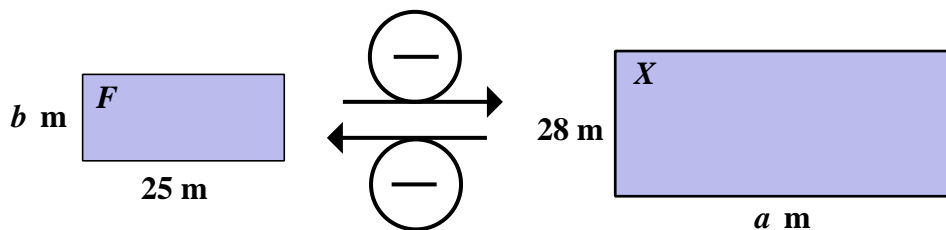
For the similar rectangles A and B , shown below, find the lengths marked p and q given that the length scale factor (greater than 1) of the similarity is $\frac{3}{2}$



[2 marks]

Question 2

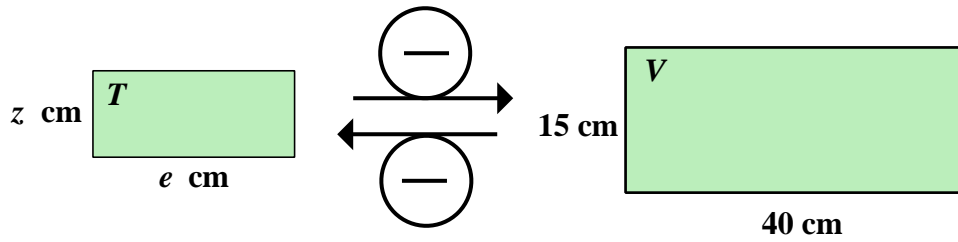
For the similar rectangles F and X , shown below, find the lengths marked a and b given that the length scale factor (greater than 1) of the similarity is $\frac{7}{5}$



[2 marks]

Question 3

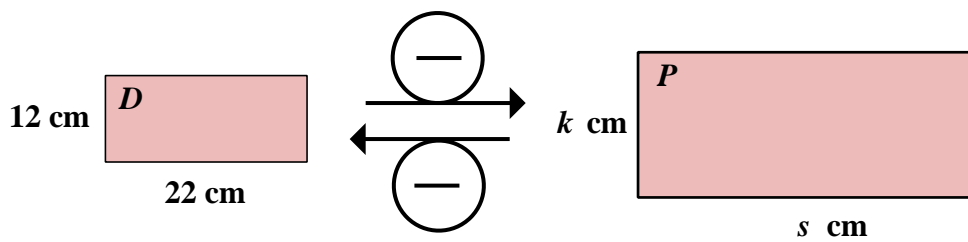
For the similar rectangles T and V , shown below, find the lengths marked e and z given that the length scale factor (greater than 1) of the similarity is $\frac{5}{3}$



[2 marks]

Question 4

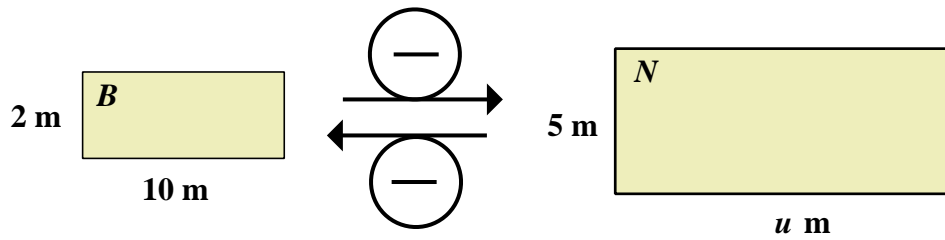
For the similar rectangles D and P , shown below, find the lengths marked k and s given that the length scale factor (less than 1) of the similarity is $\frac{2}{3}$



[2 marks]

Question 5

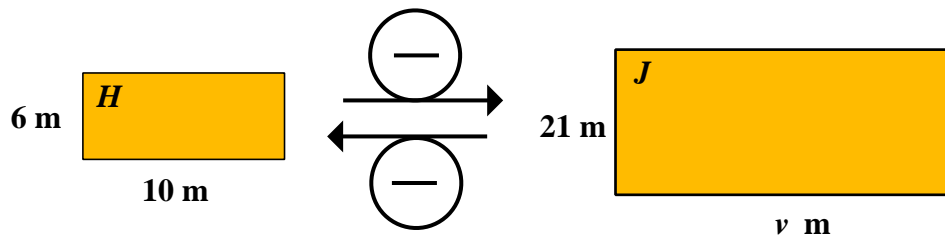
For the similar rectangles B and N , shown below, find the length scale factor (greater than 1) of the similarity and also the length marked u



[2 marks]

Question 6

For the similar rectangles H and J , shown below, find the length scale factor (greater than 1) of the similarity (cancel down the fraction) and also the length marked v



[2 marks]

Question 7

An elastic band of length 9 cm is stretched with length scale factor $\frac{7}{3}$.
What is the length of the stretched band ?

[2 marks]

Question 8

When made wet a 40 cm piece of string shrinks with length scale factor $\frac{4}{5}$.
What is the length of the shrunk string ?

[2 marks]

Question 9

Two rectangles are similar with length scale factor $\frac{11}{2}$
The smaller measures 8 cm by 18 cm.
What are the measurements of the larger ?

[2 marks]

Question 10

A rectangle has lengths that are $\frac{3}{5}$ times smaller than a larger, similar rectangle.
The larger rectangle measures 10 cm by 15 cm.
What are the measurements of the smaller rectangle ?

[2 marks]

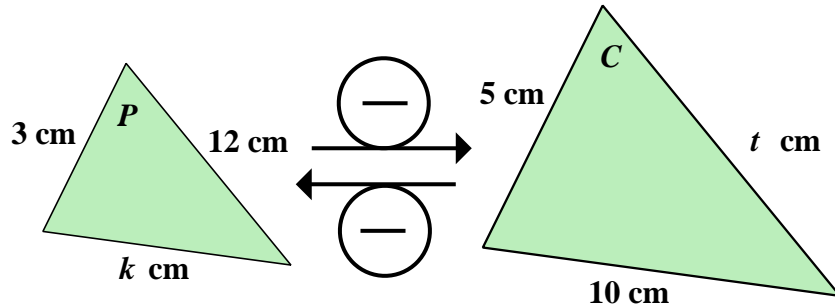
Question 11

What is the length scale factor of the enlargement that generates a line
of length 25 cm from one of length 15 cm ?
(cancel down your fraction)

[2 marks]

Question 12

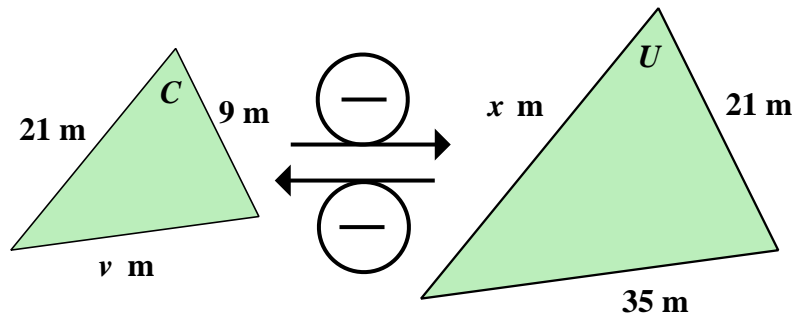
For the similar triangles P and C , shown below, find the length scale factor (greater than 1) of the similarity (cancel down the fraction) and also the lengths marked t and k



[3 marks]

Question 13

For the similar triangles C and U , shown below, find the length scale factor (greater than 1) of the similarity (cancel down the fraction) and also the lengths marked x and v



[3 marks]

Question 14

A photograph measuring 6 cm in width and 4 cm in height is to be enlarged.
The enlargement is, of course, to be similar to the original.
If the enlargement has a width of 27 cm, what must be its height ?



6 cm

27 cm



[2 marks]

Question 15

Rectangle *A* measures 8 cm by 9 cm.

Rectangle *B* measures 12 cm by 15 cm.

(i) Is rectangle *A* similar to rectangle *B* ?

[1 mark]

(ii) Explain your **part (i)** answer.

[1 mark]