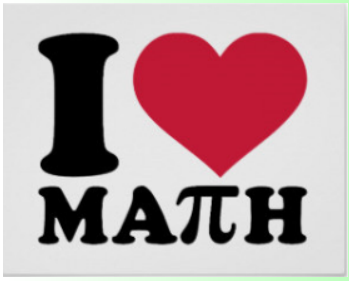
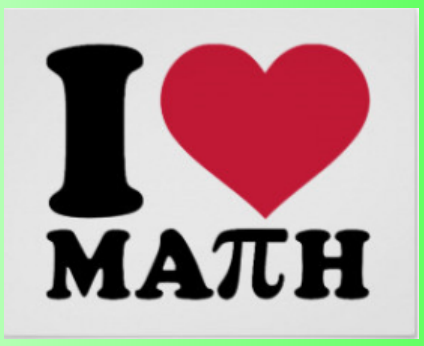


Unit 7 Similarities and Transformations



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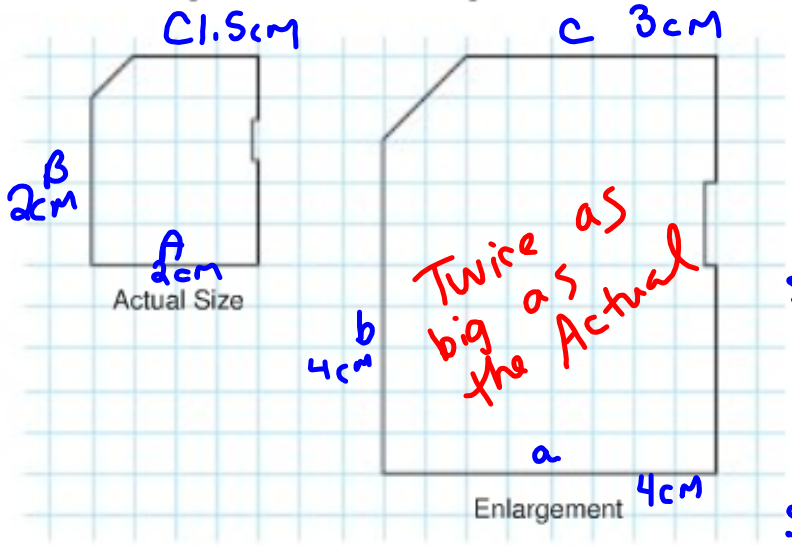
You will need 0.5-cm grid paper.

Here is an actual size drawing of a memory card for a digital camera and an enlargement of the drawing.



Twice as big as the Actual

side A $\frac{\text{Enlargement}}{\text{original}} = \frac{4}{2} = 2$

side B $\frac{\text{Enlargement}}{\text{original}} = \frac{4}{2} = 2$

side C $\frac{\text{Enlargement}}{\text{original}} = \frac{3}{1.5} = 2$

➤ Copy the drawings on grid paper.
Measure the lengths of pairs of matching sides on the drawings.
Label each drawing with these measurements.

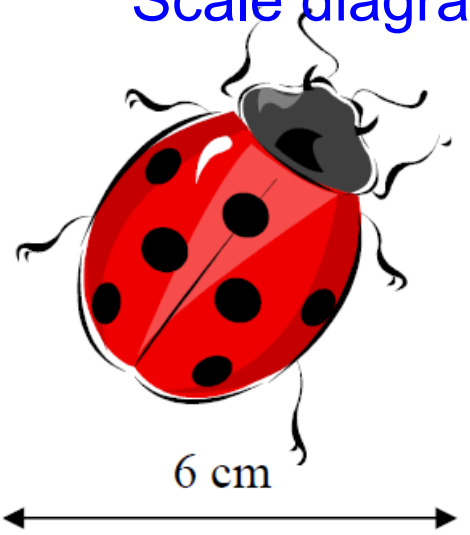
➤ For each measurement, write the fraction: $\frac{\text{Length on enlargement}}{\text{Length on actual size drawing}}$
Write each fraction as a decimal.
What do you notice about these numbers?

Section 7.1 Scale Diagrams and Enlargements

A diagram that is an enlargement (bigger) or a reduction (smaller) is called a *scale diagram*.

Actual

Scale diagram

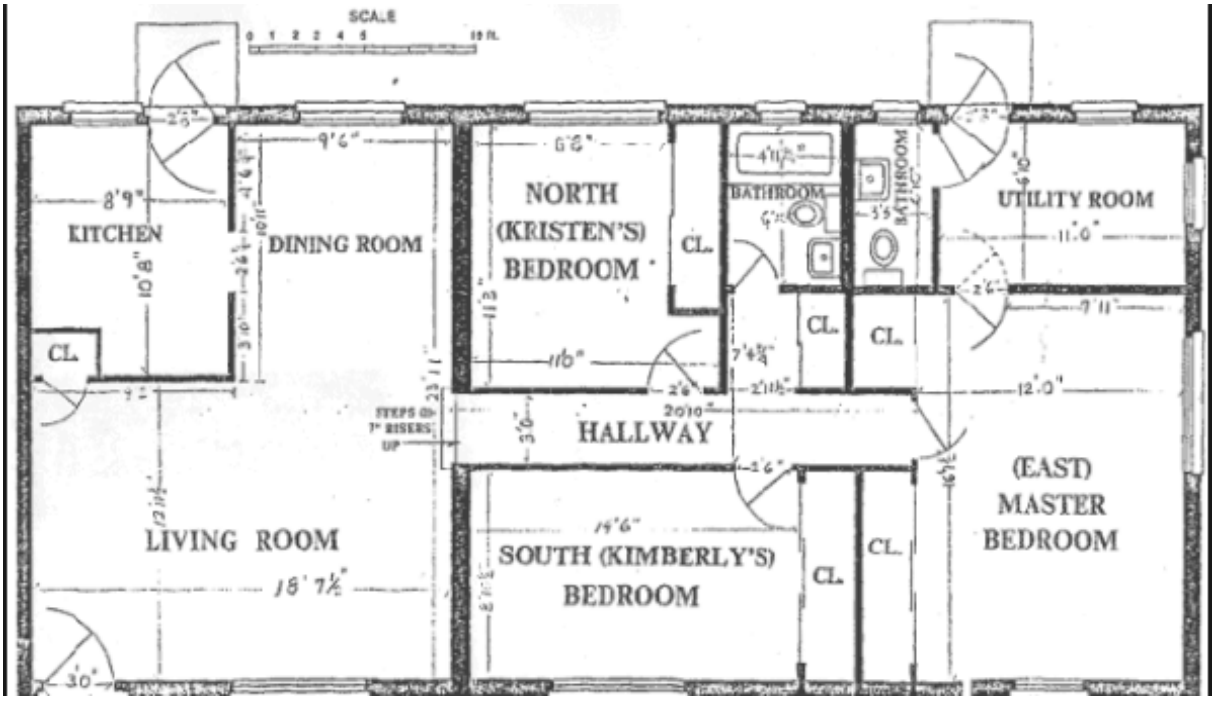


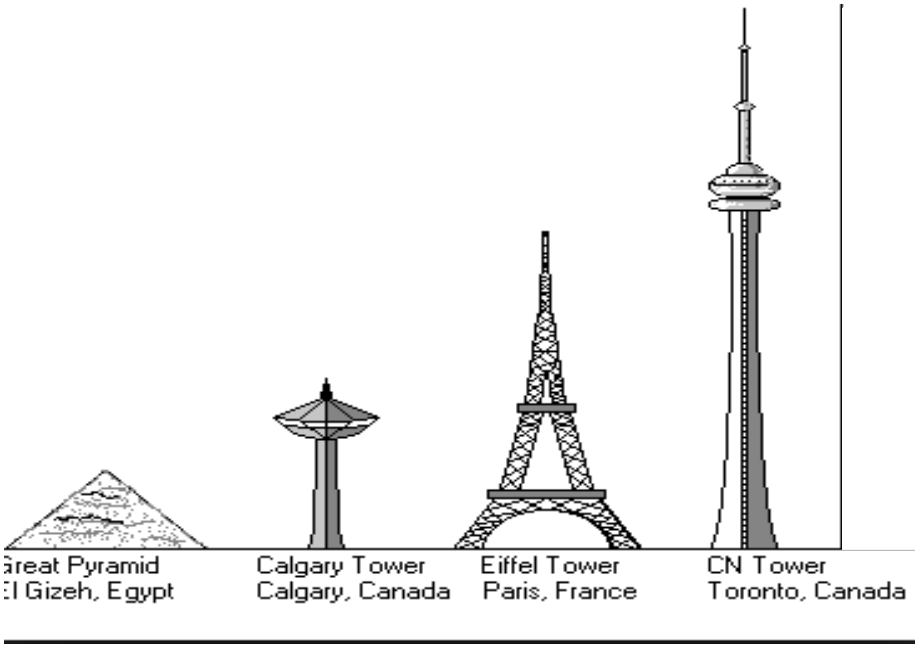
To calculate the scale factor we use:

S.F.

$$\frac{\text{Dimension of the scale diagram}}{\text{Dimension of the original diagram}} = \frac{6}{2} = 3$$

[actual]


SCALE
0 1 2 3 4 5 10 ft.
KITCHEN
8'9"
10'8"
DINING ROOM
9'6"
CL.
LIVING ROOM
18'7½"
30"
NORTH
(KRISTEN'S)
BEDROOM
6'6"
11'3"
11'6"
CL.
BATHROOM
4'11½"
6'2"
BATHROOM
5'5"
2'10"
UTILITY ROOM
11'0"
2'6"
7'11"
CL.
CL.
7'6⅝"
2'6"
2'11½"
12'0"
STEPS (3) 7" RISERS UP
23'11"
3'0"
2'10"
HALLWAY
2'6"
6½"
(EAST)
MASTER
BEDROOM
14'6"
SOUTH (KIMBERLY'S)
BEDROOM
CL.
CL.


Great Pyramid
El Gizeh, Egypt
Calgary Tower
Calgary, Canada
Eiffel Tower
Paris, France
CN Tower
Toronto, Canada

SCALE FACTOR= $\frac{\text{length of enlargement/reduction}}{\text{actual [original] size}}$

SF

***The fraction is called a** scale factor* of the diagram [can be expressed as a decimal also]

Scale Factor:

* **Greater than 1 means enlargement.**

* **Less than 1 means reductions**

Actual [original]

4cm

5 cm

Scaled Diagram

12cm

15cm

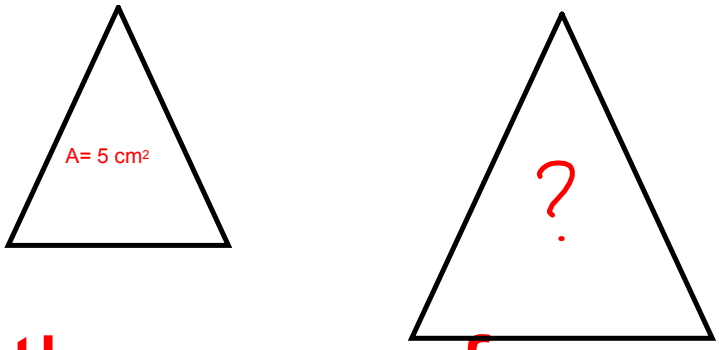
1) Is this a reduction or enlargement?

2) What is the scale factor? [length] Long side [width] short side

Scale factor = $\frac{\text{Enlargement}}{\text{actual}}$ = $\frac{15}{5}$ $\frac{12}{4}$

s.f = 3 3

The enlargement is 3 times bigger than the original.



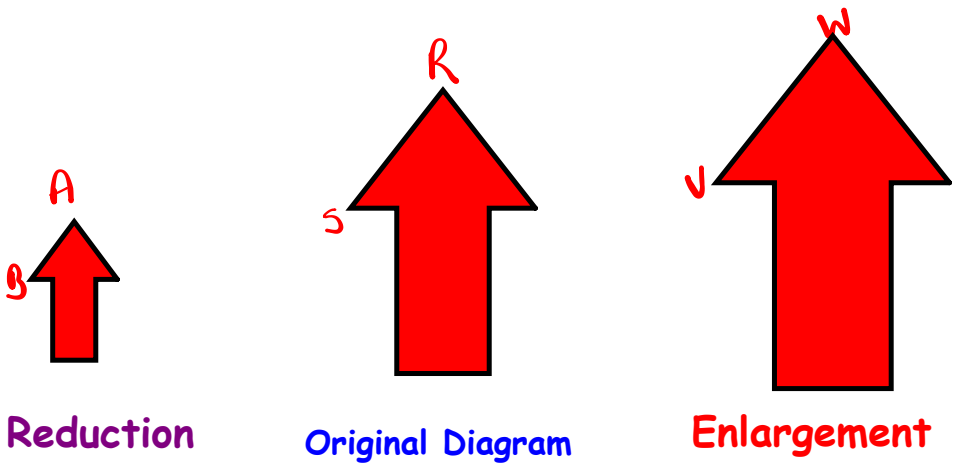
What is the area of a new triangle that is enlarged by a scale factor of 1.6 ?

New Area = Scale factor X original

1.6 X 5

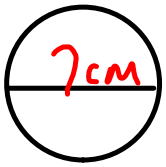
New Area = 8 cm²

Matching sides on theoriginal diagram and the scale diagram are called ***corresponding sides.***
[matching]

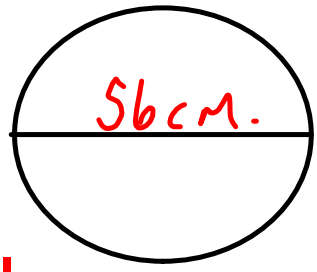


Pairs of corresponding sides all have the same scale factor so we say the lengths are *proportional.*

A. A circle has a diameter 7 cm. The diameter of the enlargement is 56 cm.
Determine the scale factor.



Original



Enlargement

Scale factor (S. F) = **Enlargement / original**

$= \frac{56}{7}$

S.F = 8

B. In a photo, the length of a model car is 4.4 cm. The photo is enlarged by a scale factor of 6.5.
Determine the length of the enlargement.

Enlargement

Actual

4.4cm

28.6cm

scaled diagram

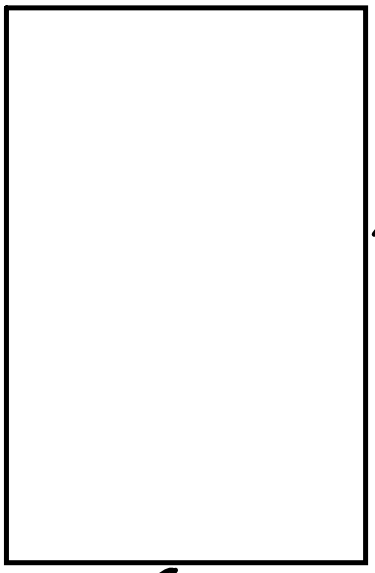
New length = S.f X original
= 6.5 X 4.4
= 28.6 cm

Draw a enlargement with a scale factor 3

Actual

12 cm

6 cm



36cm

18 cm

[long] New length = S.F x original
3x12

[short] New width = S.F x original
3x6

This photo of longhouses has dimensions 9 cm by 6 cm.
The photo is to be enlarged by a scale factor of $\frac{7}{2}$.
Calculate the dimensions of the enlargement.

original