

7.1

**Scale Diagrams and
Enlargements**

Dec. 8th, 2020

Mini-Lesson # 1 (TASK 2 & 3)

7.1

Scale Diagrams and Enlargements

Dec. 9, 2020

Nov. 7, 2

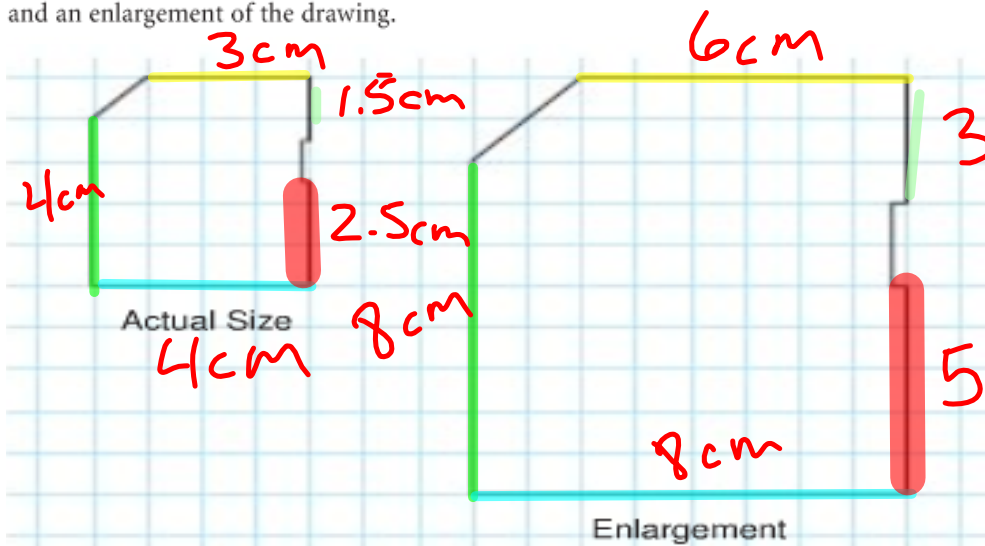
Investigate

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1cm

You will need 1 cm grid paper.

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



Handwritten calculations in red ink:

$$\frac{3}{1.5} = 2$$

$$\frac{5}{2.5} = 2$$

$$\frac{8}{4} = 2$$

$$\frac{8}{4} = 2$$

$$\frac{6}{3} = 2$$

- 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?

<http://www.geogebraTube.org/student/m106702>

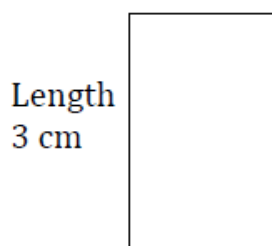
Section 7.1 Scale Diagrams and Enlargements

A diagram that is an **enlargement** or a **reduction** of another diagram is called a **scale diagram**.

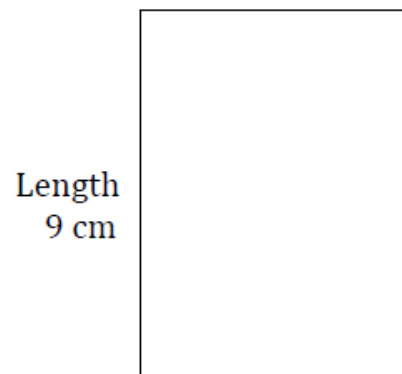
The **scale factor** is the relationship between the matching lengths on the two diagrams.

To find the scale factor of a scale diagram,

we divide: $\frac{\text{length of the scale diagram}}{\text{length of the original object}}$

Example # 1

Original



Scale Diagram

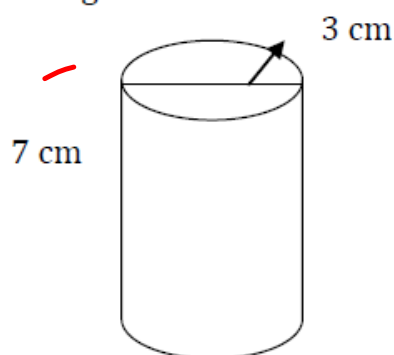
$$\text{Scale factor} = \frac{\text{length on scale diagram}}{\text{length on original diagram}} = \frac{9}{3} = 3$$

Note

- the **units must be the same** on the original and scale diagram
- if not, you must convert one to make them the same
- scale factors **do not have units**.

Example # 2

The cylinder is to be enlarged by a scale factor of $\frac{5}{2}$. Find the dimensions of the enlargement. Hint: Write the scale factor as a decimal.



$$5 \div 2 = 2.5$$

$$2.5 \times 7 = 17.5$$

$$2.5 \times 3 = 7.5$$

Answer: Rewrite scale factor: $\frac{5}{2} = 5 \div 2 = 2.5$ Multiply each dimension by the scale factor

Diameter Original: 3 cm

Diameter Enlargement: $3 \times 2.5 = 7.5$ cm

Height Original: 7 cm

Height Enlargement: $7 \times 2.5 = 17.5$ cm

The enlargement has diameter 7.5 cm and height 17.5cm.

Try this one!

A photo has dimensions 10cm by 15cm. Two enlargements are to be made with each scale factor below. Find the dimensions of each enlargement.

A) scale factor 4 B) scale factor $\frac{13}{4} = 3.25$

Answer

A) Scale Factor = 4

Original Width: 10cm

Enlargement Width: $10\text{cm} \times 4 = 40\text{cm}$

Enlargement has dimensions
40cm by 60cm

Original Length: 15cm

Scale Length: $15\text{cm} \times 4 = 60\text{cm}$

B) Scale Factor = $\frac{13}{4} = 13 \div 4 = 3.25$

Original Width: 10cm

Enlargement Width: $10\text{cm} \times 3.25 = 32.5\text{cm}$

Enlargement has dimensions
32.5cm by 48.75cm

Original Length: 15cm

Enlargement Length: $15\text{cm} \times 3.25 = 48.75\text{cm}$

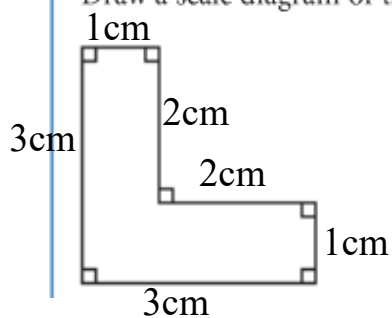
Example 2

Drawing a Scale Diagram that Is an Enlargement

Draw a scale diagram of this metal bracket. Use a scale factor of 1.5.

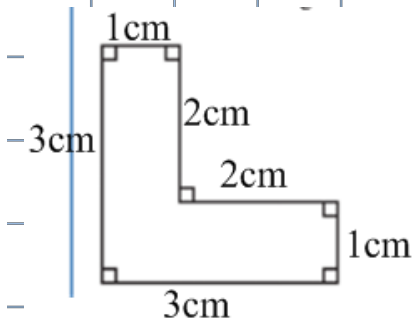
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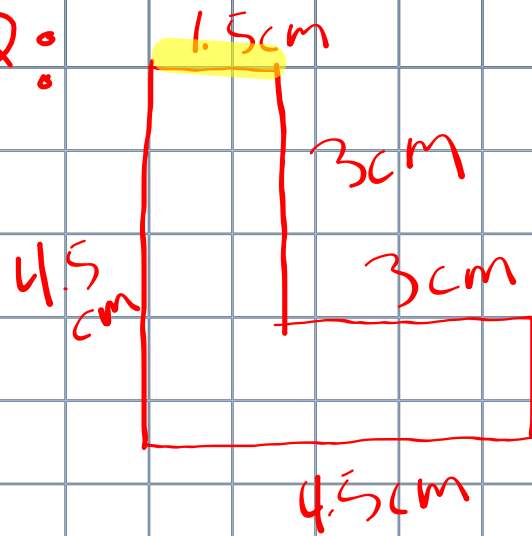


$$\begin{aligned} 1\text{cm} \times 1.5 &= 1.5\text{cm} \\ 2\text{cm} \times 1.5 &= 3\text{cm} \\ 3\text{cm} \times 1.5 &= 4.5\text{cm} \end{aligned}$$

Example 2:

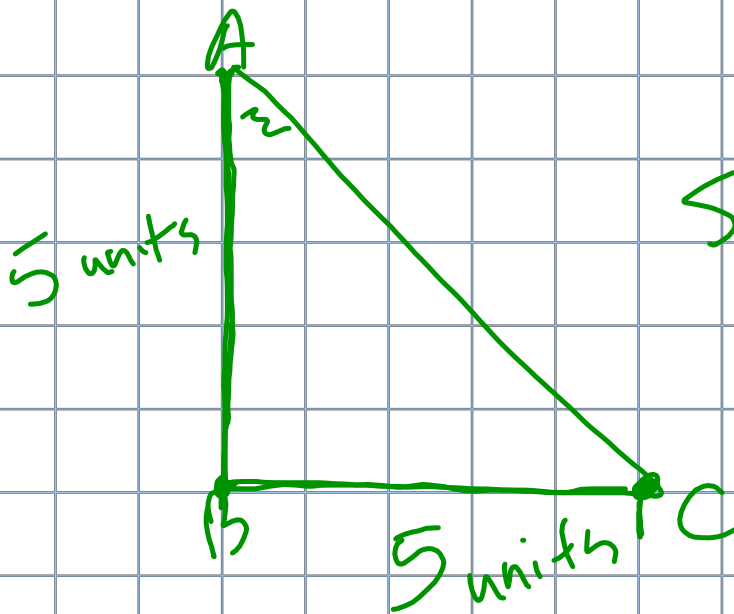


Actual



Scale diagram

Scale factor of 1.5



Scale: Actual

End of mini lesson #1