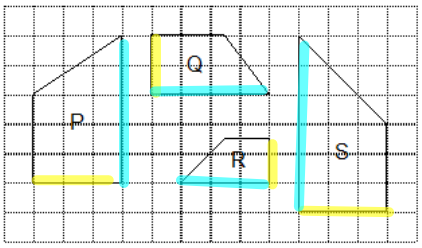
7.2 Scale Diagrams and Reductions

Dec. 16th, 2020

Mini-Lesson # 2 (TASK 2 & 3)

Which two polygons have pairs of corresponding lengths that are proportional?

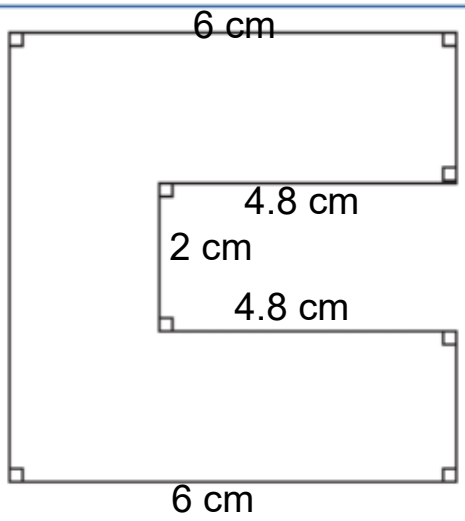


a. R and S b. Q and R c. P and S d. Both a and b

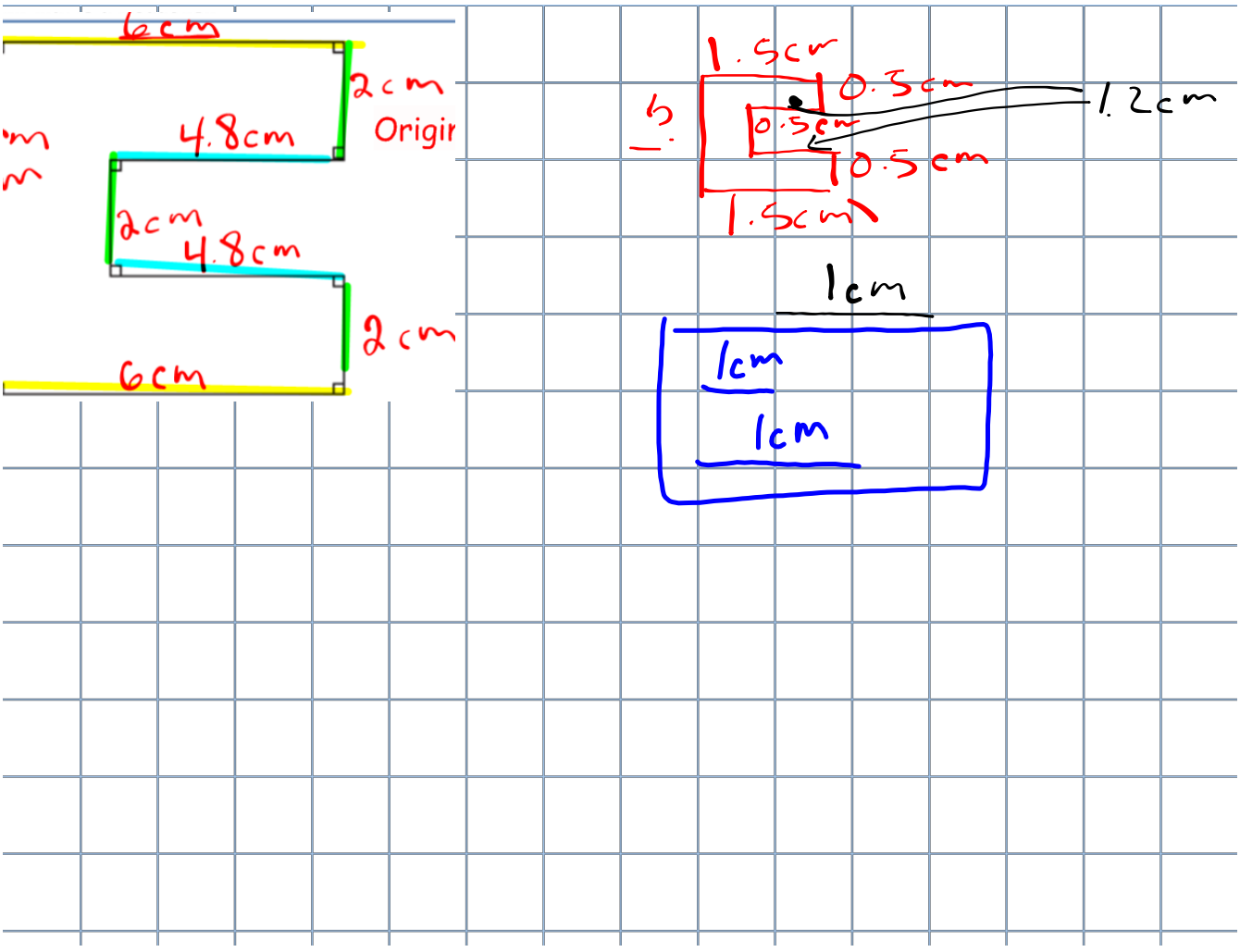
Example 1 **Drawing a Scale Diagram that Is a Reduction**

Draw a scale diagram of this octagon.
Use a scale factor of 0.25.

$6 \times 0.25 = 1.5$ cm
$2 \times 0.25 = 0.5$ cm
$4.8 \times 0.25 = 1.2$ cm



Original diagram


6cm
2cm
4.8cm
2cm
4.8cm
2cm
6cm
1.5cm
0.3cm
0.5cm
1.2cm
0.5cm
1.5cm
1cm
1cm
1cm

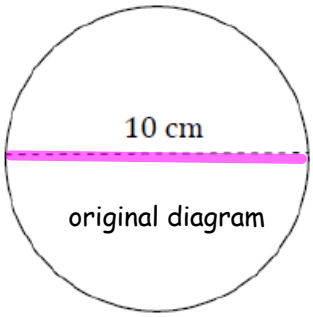
Section 7.2 Scale Diagrams and Reductions

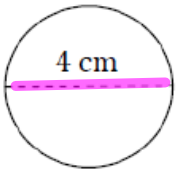
A scale diagram can be smaller than the original diagram. This type of scale diagram is called a **reduction**.

A reduction has **a scale factor between 0 and 1**.

Example #1

a). What is the scale factor?
b). Is this an enlargement or a reduction?





Scale diagram
(reduction)

Answer:
a). Scale factor = $\frac{\text{scale diagram}}{\text{original}}$

$= \frac{4}{10} = 0.4$

b). Reduction

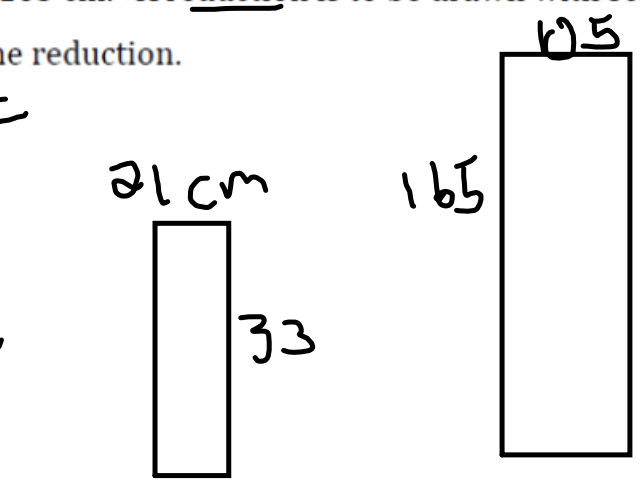
Example # 2

A top view of a patio table is 105 cm by 165 cm. A reduction is to be drawn with scale factor of $\frac{1}{5}$. Find the dimensions of the reduction.

$1 \div 5 = 0.2$ → SF

$105 \times 0.2 = 21$ cm

$165 \times 0.2 = 33$ cm



Scale diagram

Example 2

See notes!

A reduction of each object is to be drawn with the given scale factor. Determine the corresponding length in centimeters of the scale diagram:

a) A desk has length 75 cm.
The scale factor is $\frac{1}{3}$.

b) A bicycle has a wheel with diameter about 60 cm. The scale factor is $\frac{3}{50}$.

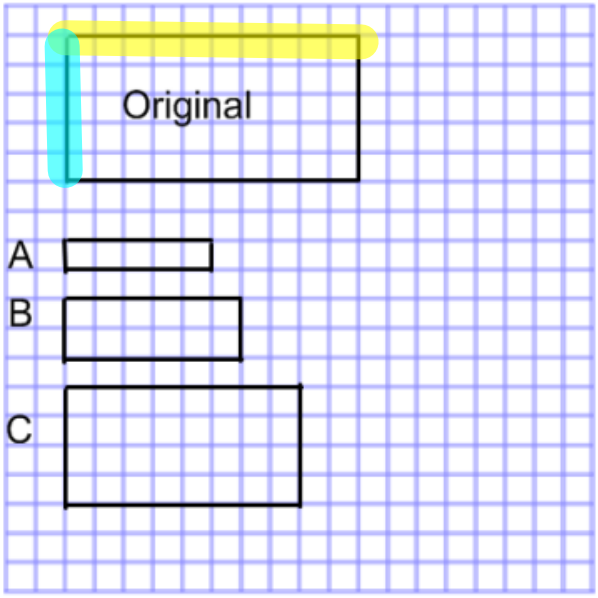
c) A surfboard has length 200 cm.
The scale factor is 0.05.

75cm x 1/3 = 25cm

60cm x 3/50
= 3.6cm

200cm x 0.05
= 10cm

Example #3: Which diagram has sides that are **proportional** to the original?

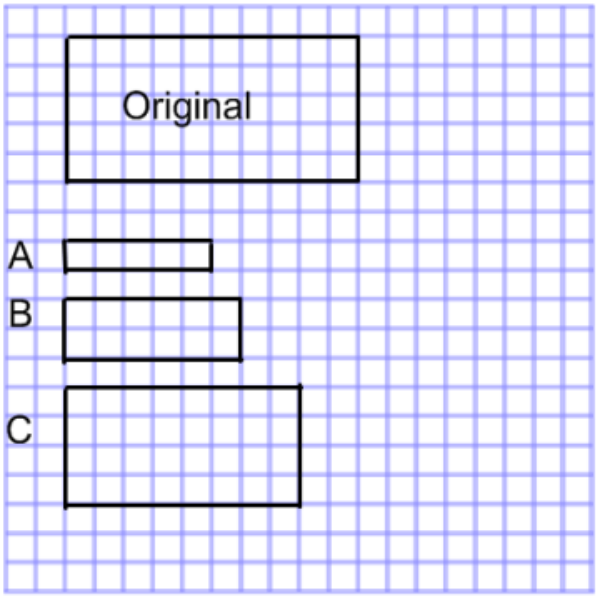


Proportion = means that 2 ratios are equal.

For example: an equation $\frac{3}{4} = \frac{6}{8}$ is a proportion.

Two diagrams are **proportional** if all sides are multiplied or divided by the same number.

Example #3: Which diagram has sides that are **proportional** to the original?



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For example: an equation $\frac{3}{4} = \frac{6}{8}$ is a proportion.

Two diagrams are **proportional** if all sides are multiplied or divided by the same number.

Answer:

Original : 5 by 10

Write as a fraction and reduce: $\frac{5}{10} = \frac{1}{2}$

A). 1 by 5 $\frac{1}{5} \neq \frac{1}{2}$ not proportional

B). 2 by 6 $\frac{1}{3} \neq \frac{1}{2}$ not proportional

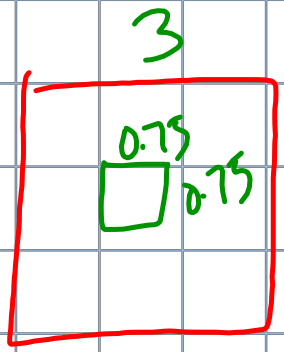
C). 4 by 8 $\frac{4}{8} = \frac{1}{2}$ is proportional

Summery:

Scale factor > 0 and < 1
Reduction

Scale factor > 1
Enlargement

$$\text{Scale factor} = \frac{\text{scale length}}{\text{original length}}$$



Reduction using 0.25 as a scale factor.

End of mini lesson #2