When we would like to determine if two shapes are similar we must check that their _____ are the same as well as their _____. If these two things are not equal then the shape will not be similar.

Review: Try to solve these in your head

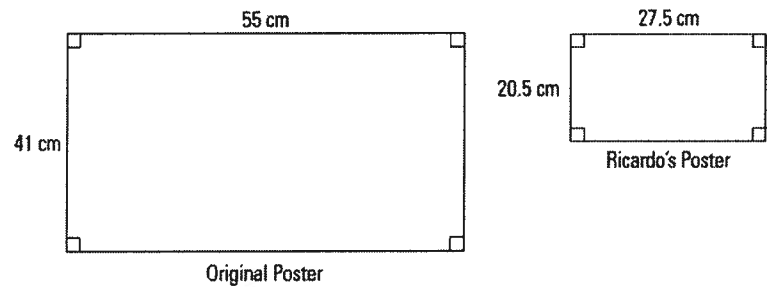$$\frac{x}{10} = \frac{30}{100}$$

$$\frac{50}{x} = \frac{45}{9}$$

$$\frac{72}{x} = \frac{108}{12}$$

Scale Factor:

Example 1
Are the following shapes similar? If so prove it

Original Poster — 55 cm, 41 cm
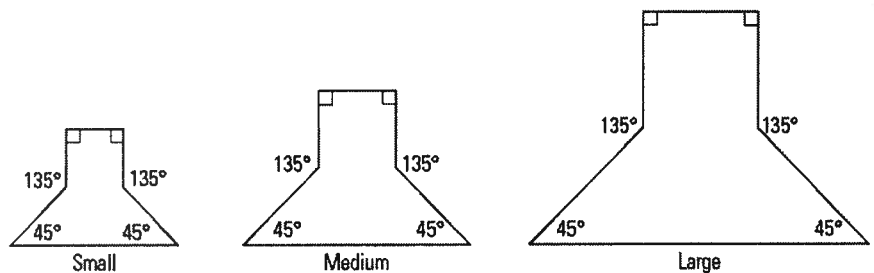
Ricardo's Poster — 27.5 cm, 20.5 cm

What is the scale factor of Ricardo's poster?

Example 2
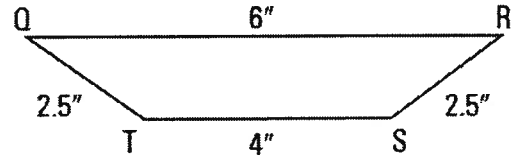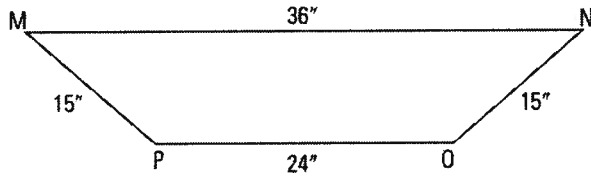To the right are some cedar hats Althea is designing in three different sizes

a) Are they the same shape?

Small — 135°, 135°, 45°, 45°

Medium — 135°, 135°, 45°, 45°

Large — 135°, 135°, 45°, 45°
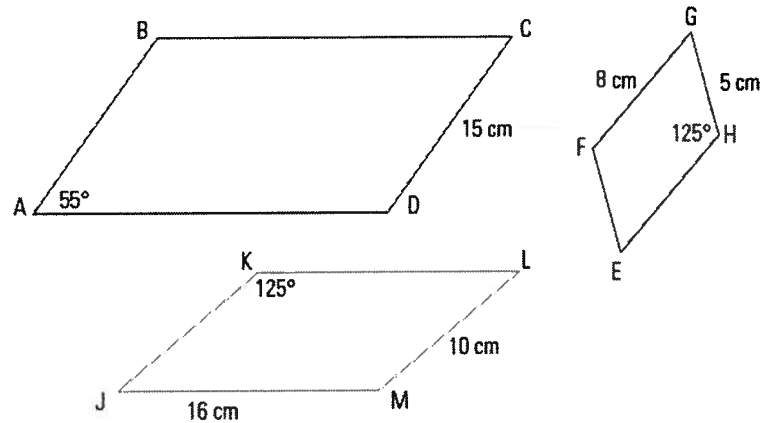
b) Are they similar figures?

Example 3

Lionel Richie is building a model boat to "sail on down the line." A model was constructed before the actual build. The model is on the left and the real size is on the right. Are they similar? What is the scale factor?

M ——————36"—————— N
15"   15"
P   24"   O

Q ——————6"—————— R
2.5"   2.5"
T   4"   S

Example 4

Rhoniel is an interior decorator who is creating a wall pattern with similar parallelogram stencils. She created the three similar parallelograms shown. She wants to make the corresponding sides of each stencil have the same four colors: brown, yellow, blue, and orange.

a) Help Rhoniel list the pairs of corresponding sides to figure out her paint colors.

B ———————— C
                15 cm
A 55°   D

G
8 cm   5 cm
F   125° H
E

b) What scale factor was used on ABCD to create EFGH?

K ———————— L
125°
            10 cm
J   16 cm   M

c) What is the measure of side BC?

d) What is the measure of angle D?

e) What is the angle measure of <L? How do you know? Explain your Answer