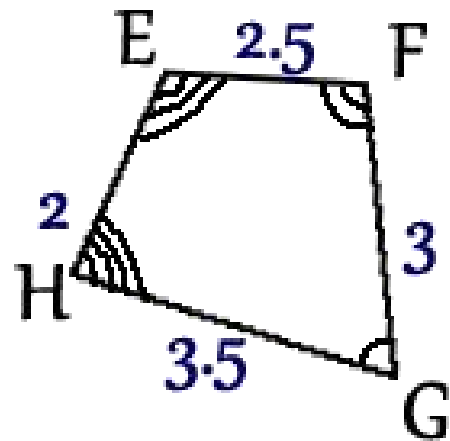
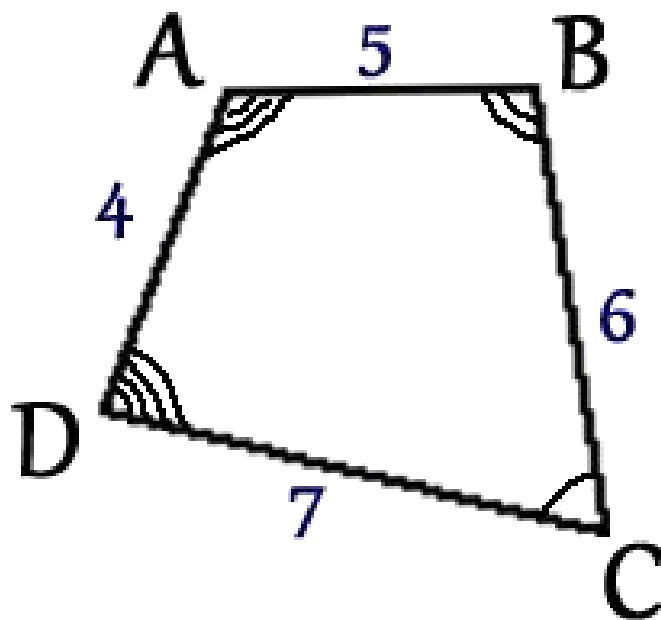
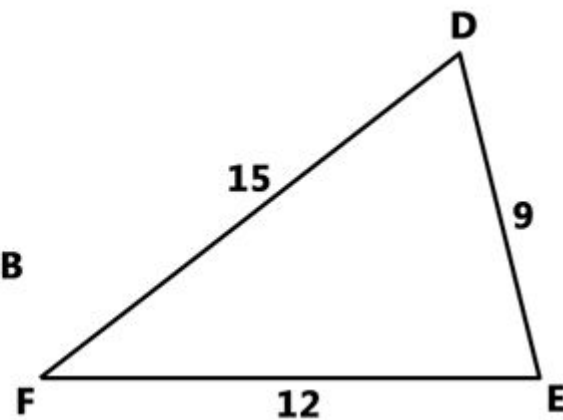
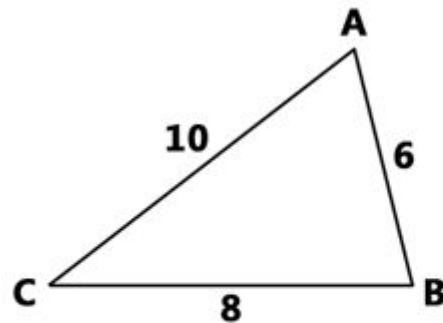
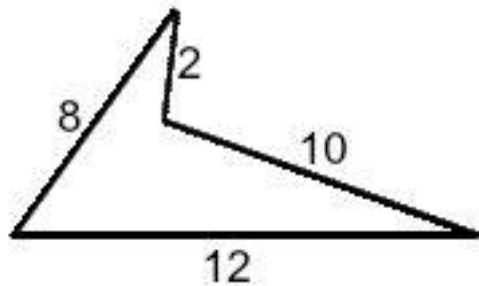
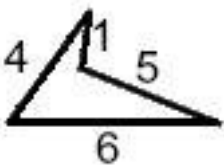


# Similar Figures

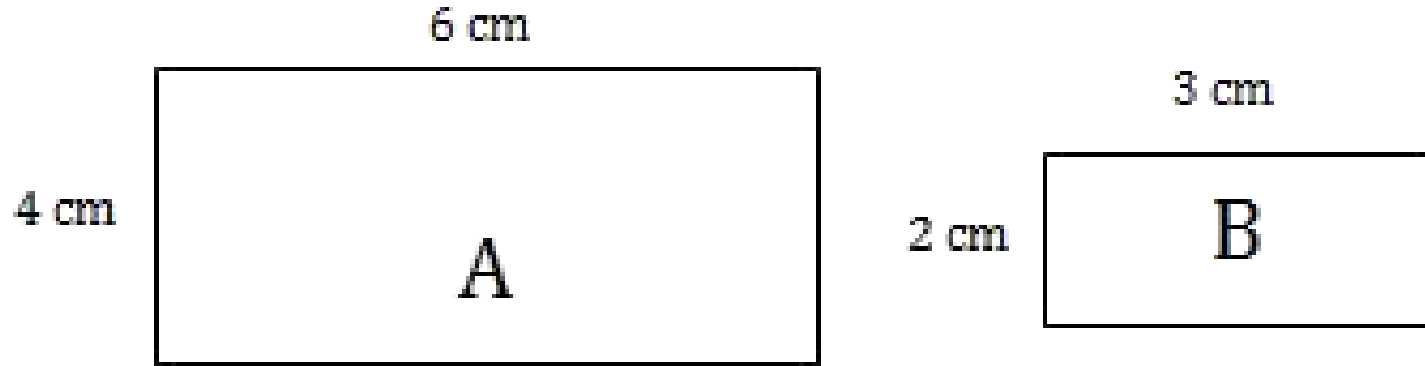
What does it mean for two shapes to be *similar*?



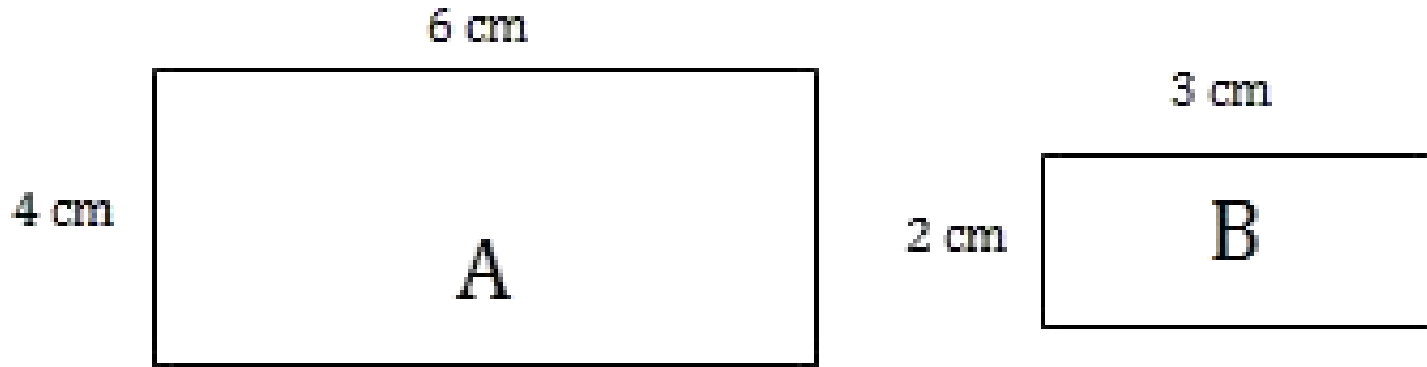
Are these shapes similar?



What is the ratio between the perimeters of these rectangles?

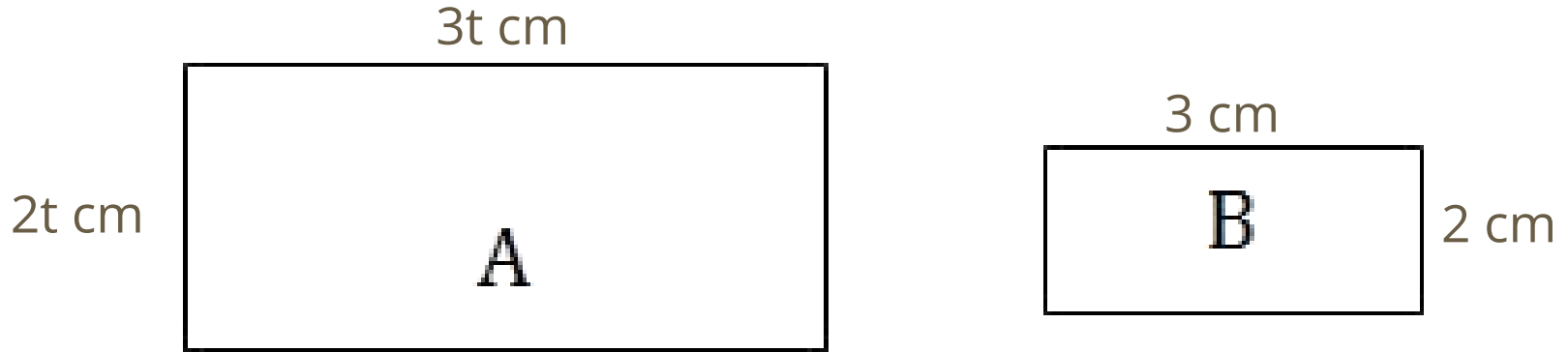


What is the ratio between the perimeters of these rectangles?



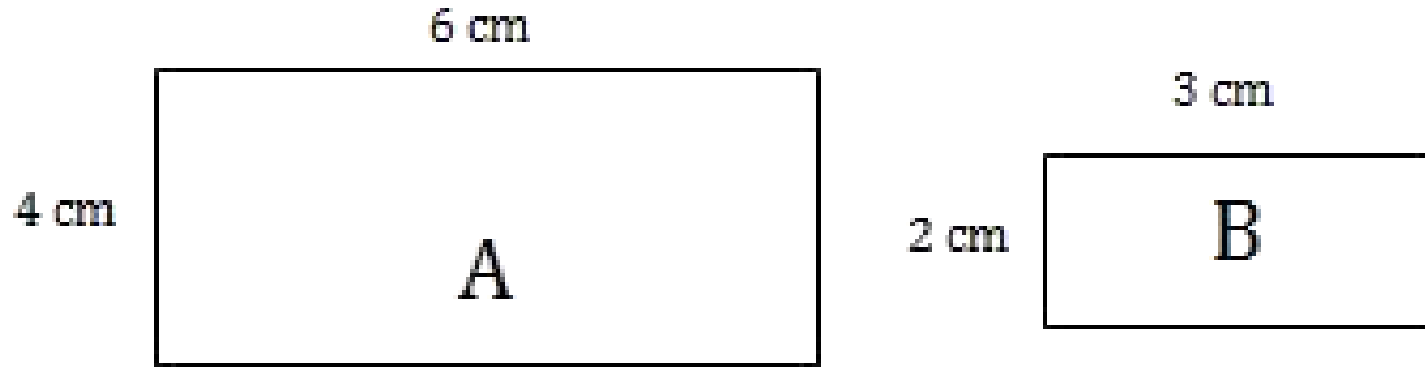
$$\frac{\textit{Perimeter of A}}{\textit{Perimeter of B}} = \frac{20}{10} = \frac{10(2)}{10} = 2$$

What is the ratio between the perimeters of these rectangles?

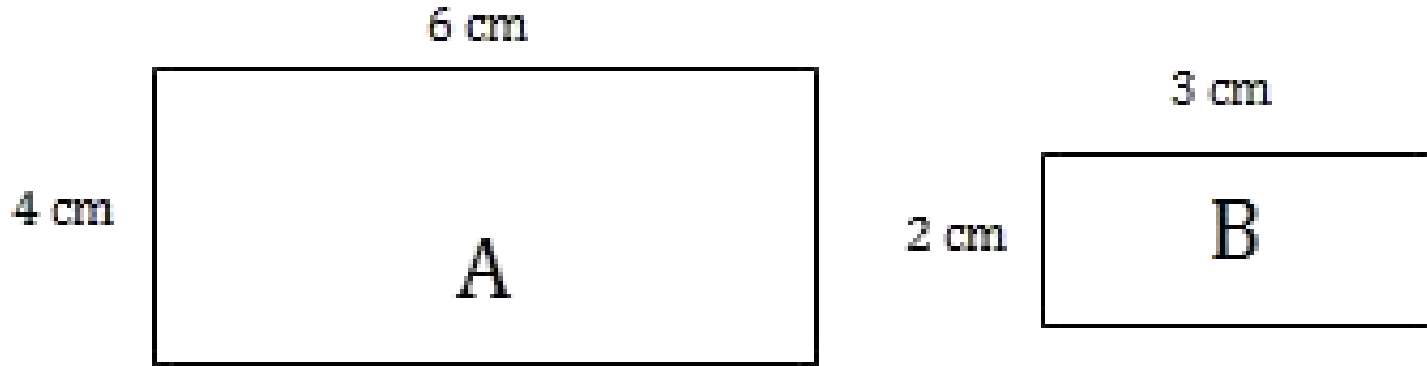


$$\frac{\text{Perimeter of A}}{\text{Perimeter of B}} = \frac{10t}{10} = \frac{10t}{10} = t$$

What is the ratio between the areas of these rectangles?

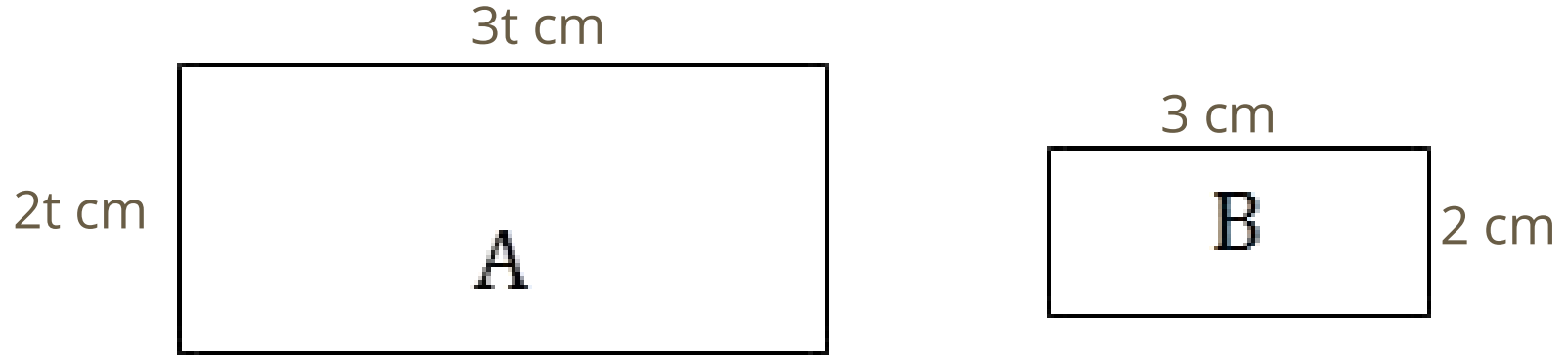


What is the ratio between the areas of these rectangles?



$$\frac{\text{Area of A}}{\text{Area of B}} = \frac{24}{6} = \frac{6(4)}{6} = 4$$

What is the ratio between the perimeters of these rectangles?



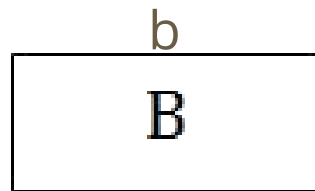
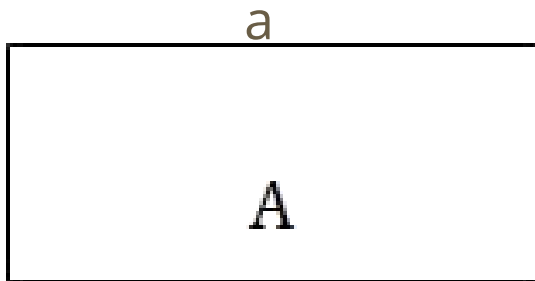
$$\frac{\text{Area of A}}{\text{Area of B}} = \frac{6t^2}{6} = t^2$$



# Perimeters of Similar Polygons

If two polygons are similar then:

$$\frac{\text{Perimeter of polygon A}}{\text{Perimeter of polygon B}} = \frac{a}{b}$$

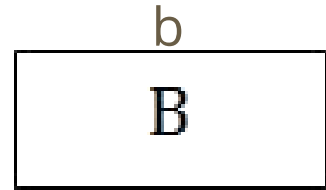
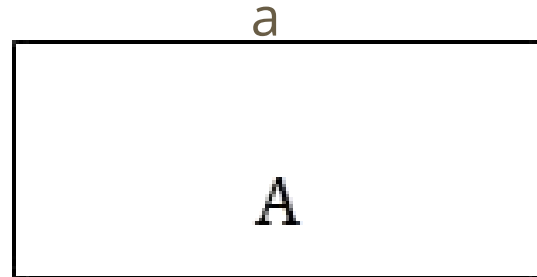


# Areas of Similar Polygons

If two polygons are similar with the lengths of corresponding sides in the ratio  $a:b$ , then the ratio of their areas is:  $a^2:b^2$

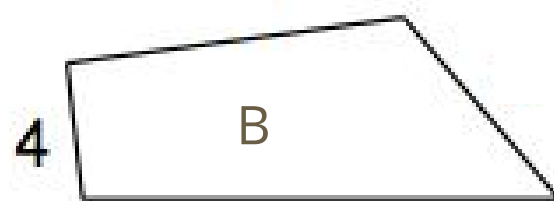
$$\frac{\text{Side length of polygon A}}{\text{Side length of polygon B}} = \frac{a}{b}$$

$$\frac{\text{Area of polygon A}}{\text{Area of polygon B}} = \frac{a^2}{b^2}$$



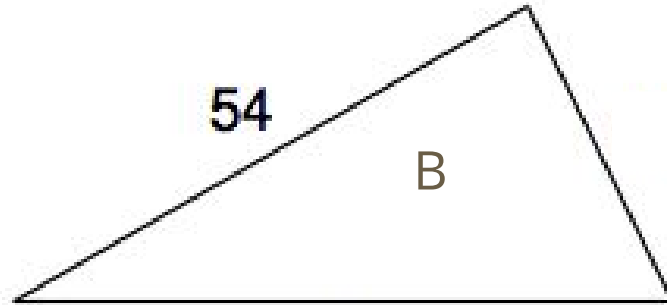
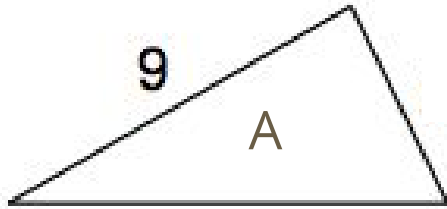
Polygon A and B are similar figures.

1. Write the ratio of the perimeters:
2. Write the ratio of areas:



Polygon A and B are similar figures.

1. Write the ratio of the perimeters:
2. Write the ratio of areas:



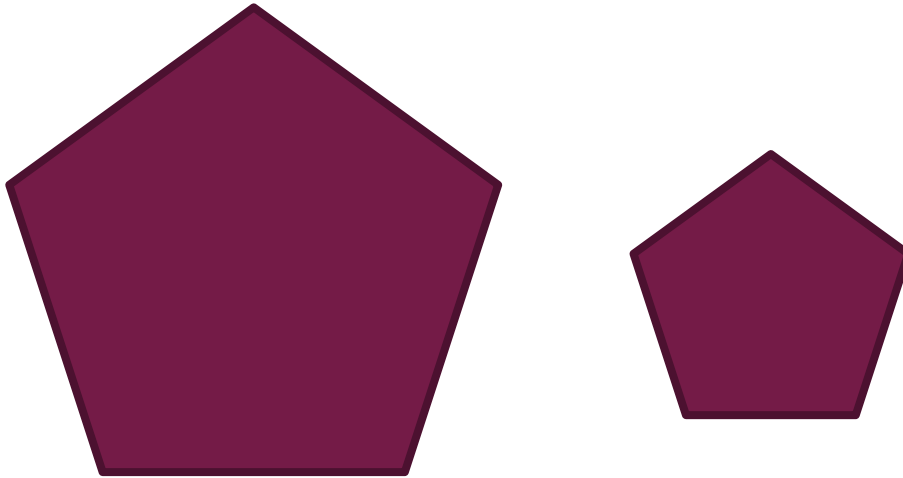
The perimeter of ABC is 16 meters, and its area is 64 square meters.

The perimeter of DEF is 12 meters.

If ABC and DEF are similar triangles, find the ratio of the area of ABC to the area of DEF.

# Regular Polygons

**Fact:** Any two regular polygons with the same number of sides are similar.



These are two regular octagons.

1. Write the ratio of the perimeters:
2. Write the ratio of areas:
3. Find the area of the smaller octagon:

