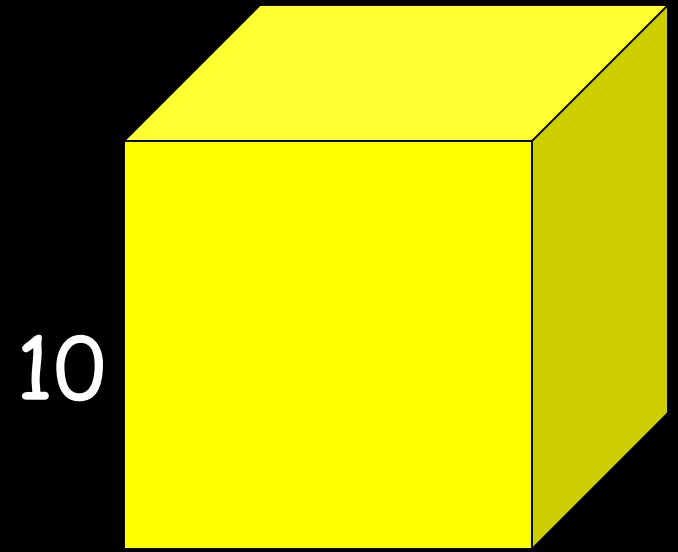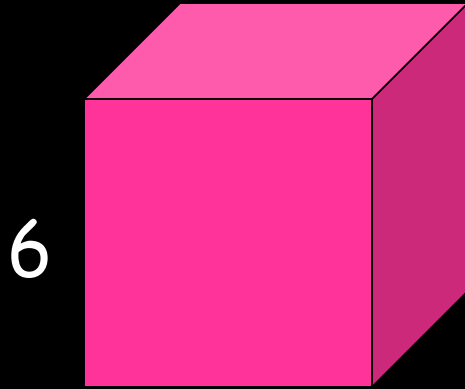# Similar Solids

Theorem 12-1

If the scale factor of two similar solids is a:b, then

     1. The ratio of their perimeters is **a:b**.

     2. The ratio of their base areas, lateral areas, and total areas is $a^2:b^2$.

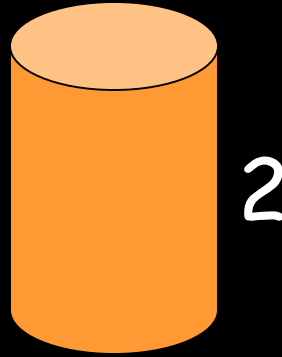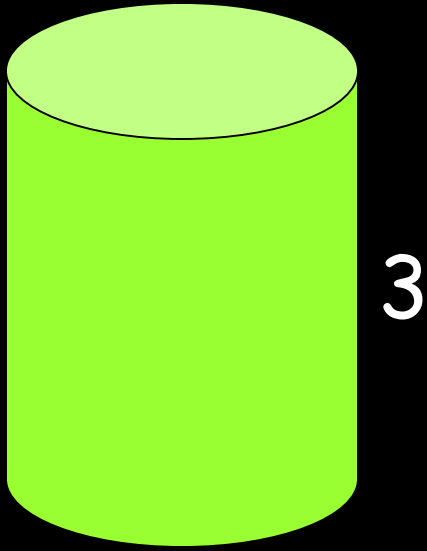   3. The ratio of their volumes is $a^3:b^3$.

Cubes

Scale Factor: 6 to 10 = 3 to 5

Ratio of Total Areas: 9 to 25

Ratio of Volumes: 27 to 125

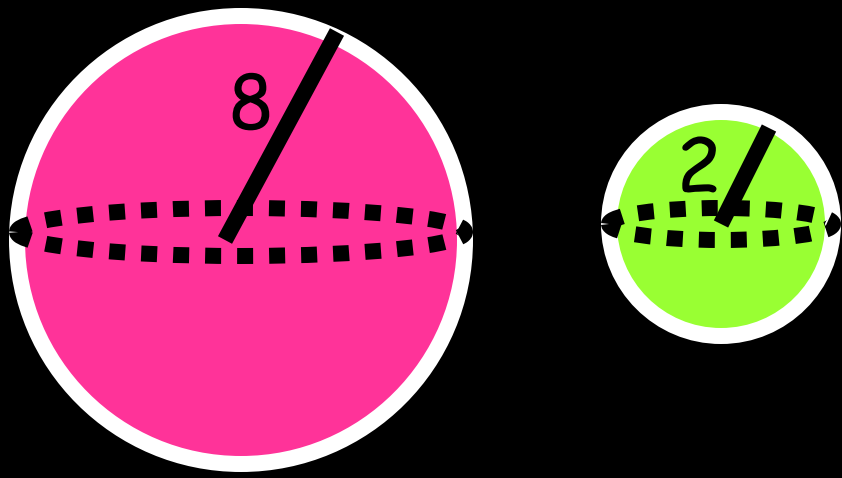All Cubes are Similar.

Similar Cylinders

Scale Factor: 3 to 2

Ratio of Total Areas: 9 to 4

Ratio of Volumes: 27 to 8

Spheres

8

2

Scale Factor: 8 to 2 = 4 to 1

Ratio of Total Areas: 16 to 1

Ratio of Volumes: 64 to 1

All Spheres are Similar.

Practice–

1) The scale factor of two similar triangles is 2:3. The longest side in the larger triangle is 27cm. What is the length of the longest side in the smaller triangle?

18 cm

2) The ratio of areas of two similar polygons is 9:25. If one side length of the smaller figure is 6m. What is the length of the corresponding side in the larger figure?

10 m

3) The ratio of perimeters of two similar pentagons is 1:4. The area of the larger pentagon is 48in^2. What is the area of the smaller pentagon?

3 in^2