Scaling in 3D

Short-answer problems about scaling in 3 dimensions.

Length, Area, and Volume Under Scaling

In this section, we explore what happens to length, area, volume, and other measures under scaling.

To explore how measures of figures change under scaling and non-scaling transformations, here are some useful strategies:

- Cutting the figures and rearranging the pieces.
- Using "rep-tiles."
- Using known formulas for perimeters, areas, volumes, or surface areas.
- Approximating with segments, squares, or cubes.

Question 1 *Given a cylinder of radius 5 and height 8, how many times greater will be the volume of . . .*

(a) *. . . a cylinder with k times the radius and the same height?* $\boxed{k^2}$

(b) *. . . a cylinder with the same radius and k times the height?* $\boxed{k}$

(c) *. . . cylinder with k times the radius and k times the height?* $\boxed{k^3}$

Question 2 *Which of the following cylinders is similar to the given a cylinder of radius 5 and height 8?*

Select All Correct Answers:

(a) *A cylinder with k times the radius and the same height?*

(b) *A cylinder with the same radius and k times the height?*

(c) *A cylinder with k times the radius and k times the height?* ✓

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(d) *None of the above*

The similar cylinder will have surface area $\boxed{k^2}$ *times the surface area of the original cylinder.*