

TOPIC 18-3: CHANGING DIMENSIONS IN 3-D

Describe how changing the dimensions of a solid affects the volume of the solids in the table.

	Change in dimensions	Volume before change	Volume after change	How volume changed
A rectangular prism with length of 4 feet, width of 3 feet, and height of 6 feet	All dimensions are doubled			
A cylinder with a radius of 2 feet and a height of 8 feet	All dimensions are tripled			
A cone with a slant height of 26 meters and a radius of 10 meters	Only the radius is doubled			
A cylinder with a radius of 3 cm and a height of 6 cm	Only the height is tripled			
A cone with a radius of 3 feet and a height of 5 feet	Only the height is doubled			
A square pyramid with a side length of 4 inches and a height of 6 inches	The height is doubled and the side length is tripled			
A sphere with a radius of 12 inches	The radius is multiplied by $\frac{1}{4}$			

What can you conclude from the table?

EXAMPLE 1: The radius and height of a cylinder are multiplied by 2. Describe the effect on the volume.

EXAMPLE 2: A pyramid has a volume of 112 cubic inches. Find its volume if all its dimensions were increased to four times their original length.

EXAMPLE 3: If the height of a cylinder remains the same, but the radius is reduced to one-third its original length, how will the volume change?

EXAMPLE 4: Suppose the Volume of a right triangular prism is 360 cubic units. What would be its new volume if one of its dimensions was twice as long, a second dimension was three times as long, and the third dimension was half as long?