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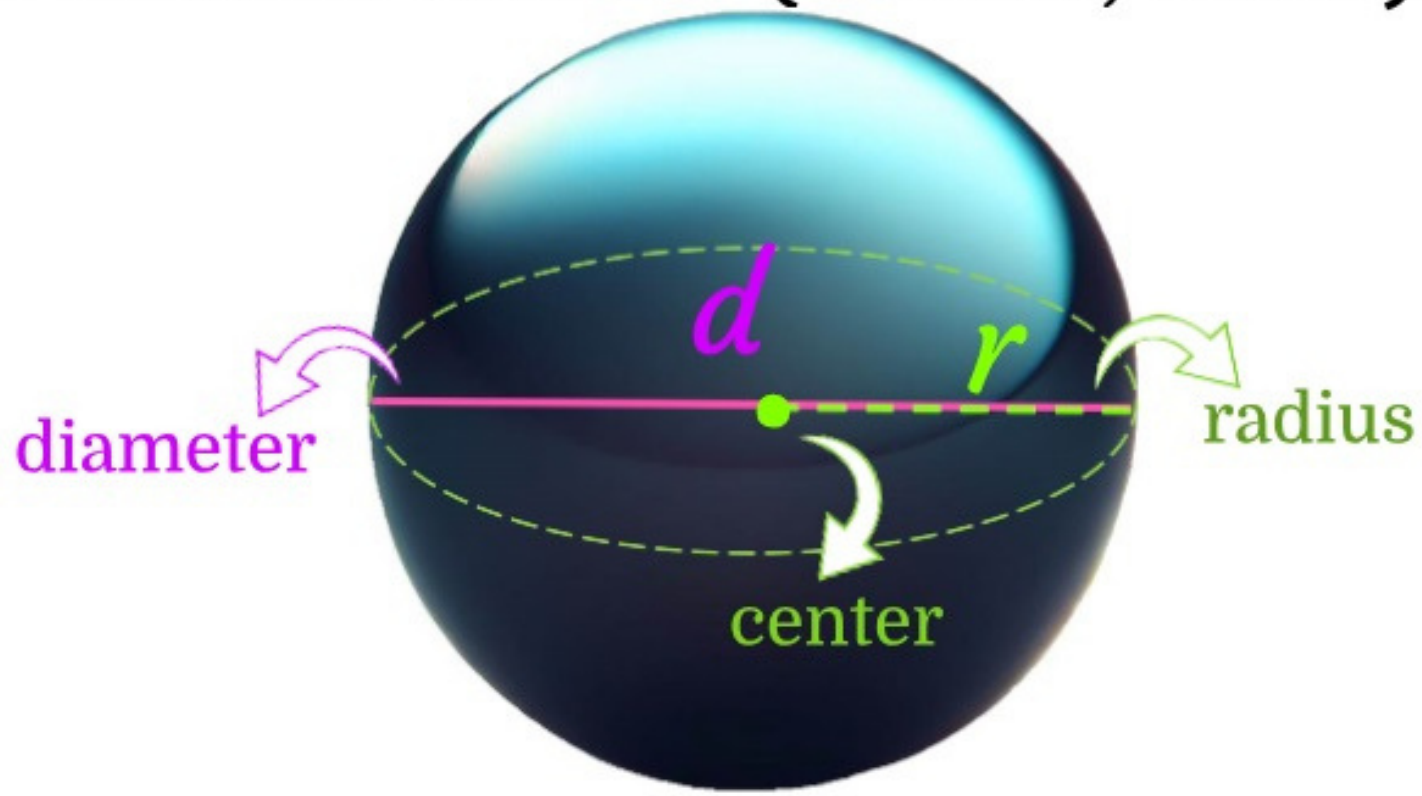
SPHERE

Is a solid bounded by a surface in which every point is equally distant from a point called center (Milne, 1899).



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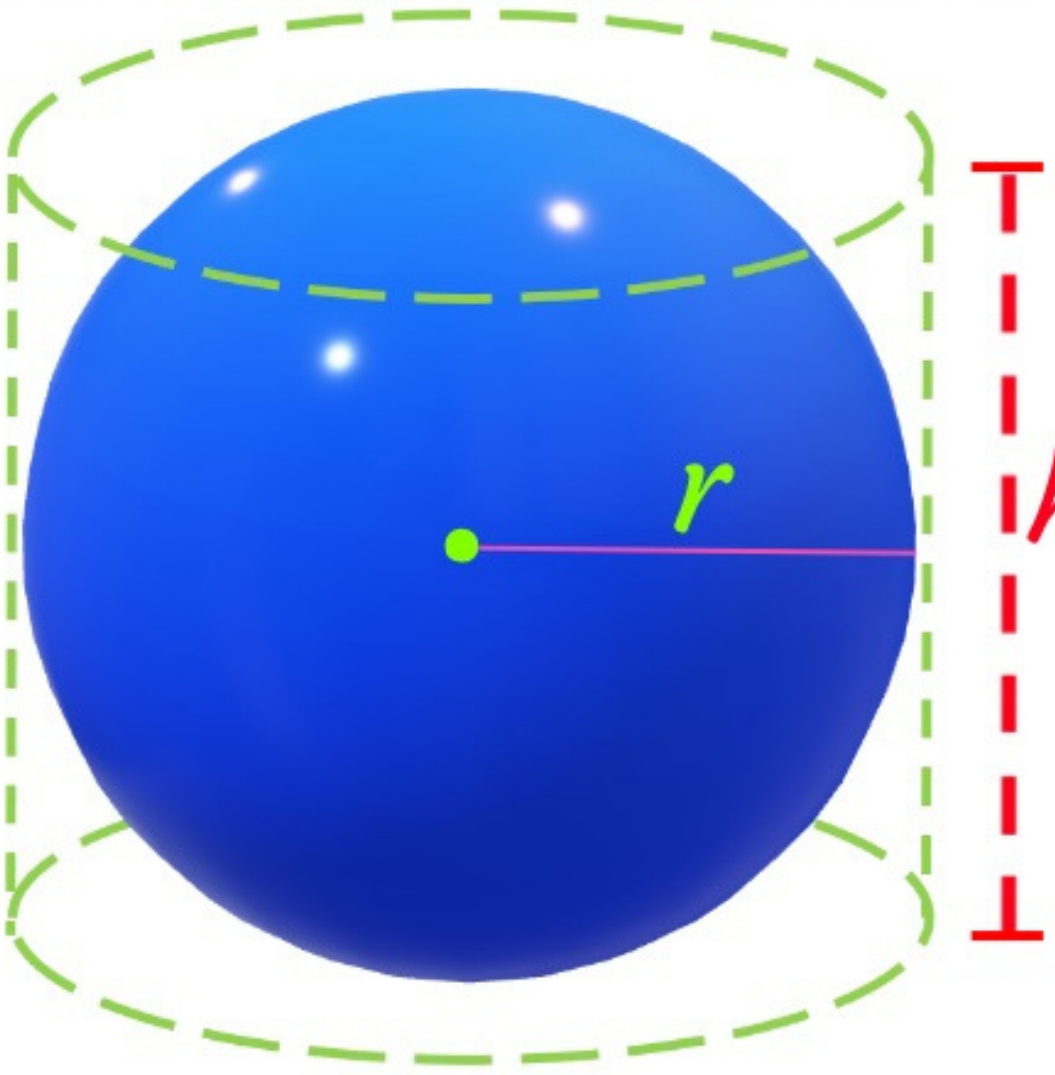
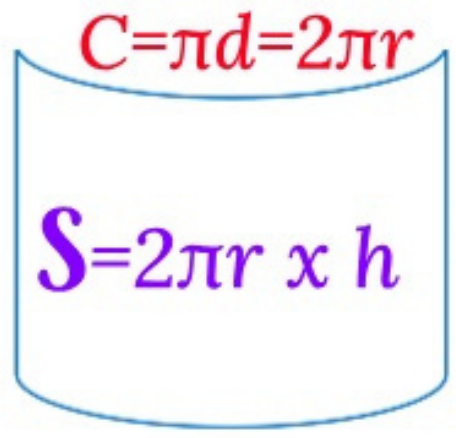
SURFACE OF A SPHERE

The surface area of a sphere is the same as a cylindrical surface area. By inscribing the sphere in a cylinder:



Area of the lateral surface of a cylinder:



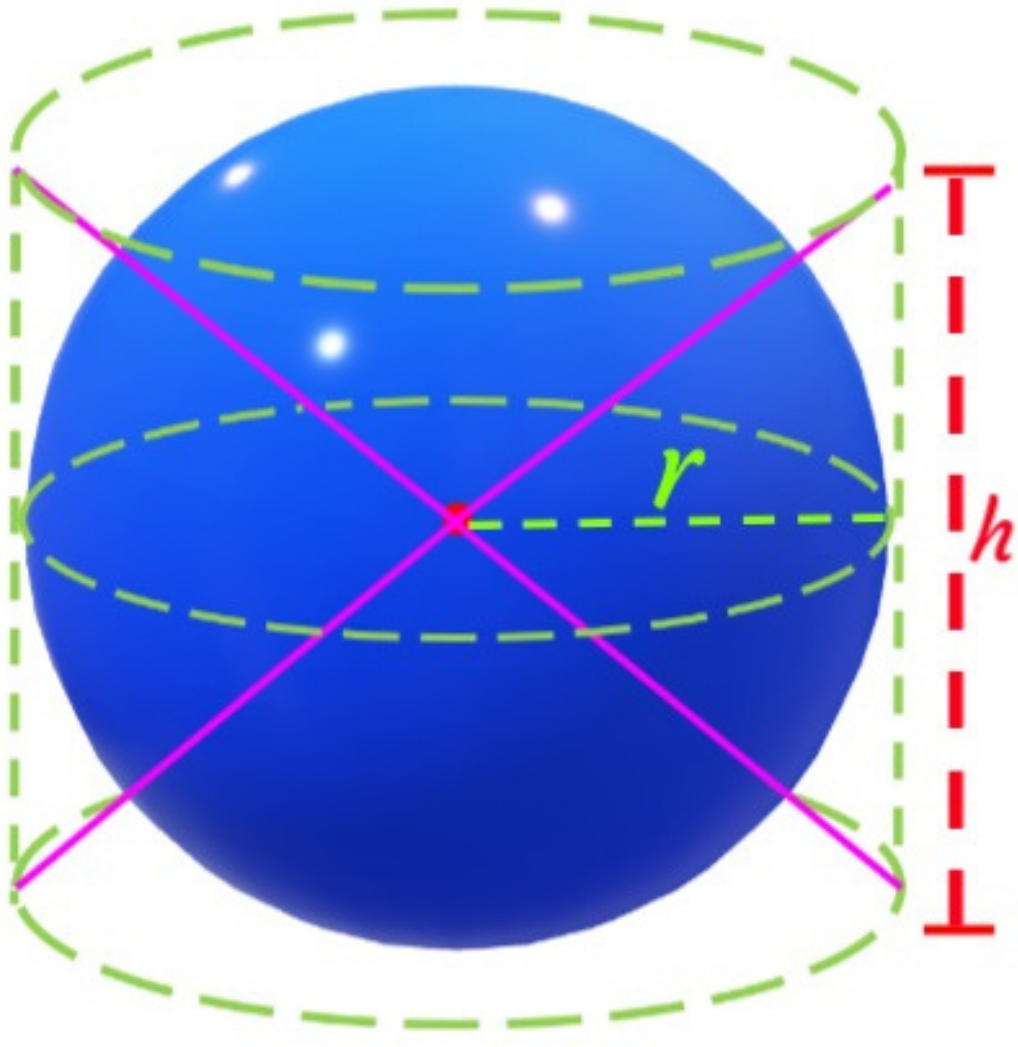
Substituting h=2r:

$$S = 2\pi r \times (2r)$$

$$S_{Sphere} = 4\pi r^2$$

VOLUME OF A SPHERE

Sphere and a double cone of revolution inscribed in a cylinder:



Cavalieri´s Principle:

$$V_{Sphere} = V_{Cylinder} - V_{Cone}$$

$$V_{Sphere} = \pi r^2 h - \frac{\pi r^2 h}{3}$$

$$V_{Sphere} = \frac{2\pi r^2 h}{3}$$

Substituting h=2r:

$$V_{Sphere} = \frac{4\pi r^3}{3} = S\,\frac{1}{3}\,r$$