

1. Convert the given coordinate points to the other two forms.

Rectangular	Cylindrical	Spherical
$(3, 4, -12)$		
	$\left(10, \frac{5\pi}{3}, 6\right)$	
		$\left(6, \frac{\pi}{4}, \frac{5\pi}{6}\right)$

2. Evaluate

$$\int_0^{\sqrt{\pi}} \int_0^x \int_0^{xz} x^2 \sin y \, dy \, dz \, dx$$

3. Evaluate

$$\int_{-3}^3 \int_0^{\sqrt{9-x^2}} \int_0^{9-x^2-y^2} \sqrt{x^2 + y^2} \, dz \, dy \, dx$$

4. Find the volume of the region E bounded by the paraboloids $z = x^2 + y^2$ and $z = 24 - 2x^2 - 2y^2$.

5. Find the volume of the solid that lies above the cone $\phi = \pi/3$ and below the sphere $\rho = 4 \cos \phi$