

SPHERICAL COORDINATE CONVERSIONS - ANSWERS

Convert from spherical, (ρ, θ, φ) , to rectangular, (x, y, z) , coordinates.

1. $(1, 0, 0)_{\text{spherical}} \rightarrow (0, 0, 1)_{\text{rectangular}}$
2. $(3, 0, \pi)_{\text{spherical}} \rightarrow (0, 0, -3)_{\text{rectangular}}$
3. $(1, \pi/6, \pi/6)_{\text{spherical}} \rightarrow \left(\frac{\sqrt{3}}{4}, \frac{1}{4}, \frac{\sqrt{3}}{2}\right)_{\text{rectangular}}$
4. $(2, \pi/2, 3\pi/4)_{\text{spherical}} \rightarrow (0, \sqrt{2}, -\sqrt{2})_{\text{rectangular}}$
5. $(4, \pi/4, \pi/6)_{\text{spherical}} \rightarrow (\sqrt{2}, \sqrt{2}, 2\sqrt{3})_{\text{rectangular}}$

Convert from rectangular, (x, y, z) , to spherical, (ρ, θ, φ) , coordinates.

6. $(-3, 0, 0)_{\text{rectangular}} \rightarrow \left(3, \pi, \frac{\pi}{2}\right)_{\text{spherical}}$
7. $(1, 1, \sqrt{2})_{\text{rectangular}} \rightarrow \left(2, \frac{\pi}{4}, \frac{\pi}{4}\right)_{\text{spherical}}$
8. $(\sqrt{3}, 0, 1)_{\text{rectangular}} \rightarrow \left(2, 0, \frac{\pi}{3}\right)_{\text{spherical}}$
9. $(-\sqrt{3}, -3, -2)_{\text{rectangular}} \rightarrow \left(4, \frac{4\pi}{3}, \frac{2\pi}{3}\right)_{\text{spherical}}$
10. $(1, -1, -\sqrt{2})_{\text{rectangular}} \rightarrow \left(2, \frac{7\pi}{4}, \frac{3\pi}{4}\right)_{\text{spherical}}$