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Convert the spherical point (ρ, ϕ, θ) into rectangular coordinates.

5. $(4, 0, \pi)$

7. $(4, \frac{\pi}{2}, 0)$

9. $(2, \frac{\pi}{4}, 0)$

11. $(\sqrt{2}, \frac{\pi}{4}, \frac{\pi}{4})$

Convert the equation into spherical coordinates.

13. $x^2 + y^2 + z^2 = 9$

15. $y = x$

17. $z = 2$

19. $z = \sqrt{3(x^2 + y^2)}$

Sketch the graph of the spherical equation.

21. $\rho = 2$

23. $\phi = \frac{\pi}{4}$

25. $\theta = 0$

27. $\phi = \frac{3\pi}{4}$

Sketch the region defined by the given ranges.

29. $0 \le \rho \le 4,\ 0 \le \phi \le \frac{\pi}{4},\ 0 \le \theta \le \pi$

31. $0 \le \rho \le 2,\ 0 \le \phi \le \frac{\pi}{2},\ 0 \le \theta \le \pi$

33. $0 \le \rho \le 3,\ 0 \le \phi \le \pi,\ 0 \le \theta \le \pi$

Set up and evaluate the indicated triple integral in an appropriate coordinate system.

39. $\iiint_Q (x^2+y^2+z^2)^{5/2}\,dV$, where Q is bounded by $x^2+y^2+z^2=2$, $z\ge 0$ and the xy-plane.

41. $\iiint_Q (x^2+y^2+z^2)\,dV$, where Q is the cube with $0\le x\le 1$, $1\le y\le 2$ and $3\le z\le 4$.

43. $\iiint_Q (x^2+y^2)\,dV$, where Q is bounded by $z=4-x^2-y^2$ and the xy-plane.

Use an appropriate coordinate system to find the volume of the given solid.

47. The region below $x^2+y^2+z^2=4z$ and above $z=\sqrt{x^2+y^2}$

49. The region inside $z=\sqrt{x^2+y^2}$ and below $z=4$

51. The region under $z=\sqrt{x^2+y^2}$ and above the square $-1\le x\le 1$, $-1\le y\le 1$

53. The region below $x^2+y^2+z^2=4$, above $z=\sqrt{x^2+y^2}$ in the first octant.

Evaluate the iterated integral by changing coordinate systems.

57. $\int_0^1\int_{-\sqrt{1-x^2}}^{\sqrt{1-x^2}}\int_{-\sqrt{1-x^2-y^2}}^{\sqrt{1-x^2-y^2}} \sqrt{x^2+y^2+z^2}\,dzdydx$

59. $\int_{-2}^{2}\int_0^{\sqrt{4-x^2}}\int_{\sqrt{x^2+y^2}}^{\sqrt{8-x^2-y^2}} (x^2+y^2+z^2)^{3/2}\,dzdydx$

61. Find the center of mass of the solid with constant density and bounded by $z=\sqrt{x^2+y^2}$ and $z=\sqrt{4-x^2-y^2}$.

62. Find the center of mass of the solid with constant density in the first quadrant and bounded by $z=\sqrt{x^2+y^2}$ and $z=\sqrt{4-x^2-y^2}$.