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Use a double integral to compute the area of the region bounded by the curves.

5. $y = x^2,\ \ y = 8 - x^2$

9. $y = x^2,\ \ x = y^2$

Compute the volume of the solid bounded by the given surfaces.

11. $2x + 3y + z = 6$ and the three coordinate planes

13. $z = 4 - x^2 - y^2,\ \ z = 0,\ \ x = -1,\ \ x = 1,\ \ y = -1,\ \ y = 1$

15. $z = 1 - y,\ \ z = 0,\ \ y = 0,\ \ x = 1,\ \ x = 2$

17. $z = 1 - y^2,\ \ x + y = 1$ and the three coordinate planes (first octant)

19. $z = x^2 + y^2,\ \ z = 0,\ \ y = x^2,\ \ y = 4$

21. $z = x + 2,\ \ z = 0,\ \ x = y^2 - 2,\ \ x = y$

Set up a double integral for the volume bounded by the given surfaces and estimate it numerically.

23. $z = \sqrt{x^2 + y^2},\ \ y = 4 - x^2,$ first octant

Find the mass and center of mass of the lamina with the given density.

27. Lamina bounded by $y = x^3$ and $y = x^2,\ \rho(x, y) = 4$

29. Lamina bounded by $x = y^2$ and $x = 1,\ \rho(x, y) = y^2 + x + 1$

31. Lamina bounded by $y = x^2\ \ (x > 0),\ \ y = 4$ and $x = 0,\ \ \rho(x, y) =$ distance from y-axis