p.1045 (13.3)

Find the area of the region bounded by the given curve.

5. $r = 3 + 2\sin\theta$

7. $r = 2\sin\theta$

9. one leaf of $r = \sin 3\theta$

11. inside $r = 2\sin 3\theta$, outside $r = 1$, first quadrant

Use polar coordinates to evaluate the double integral.

13. $\iint_R \sqrt{x^2 + y^2}\, dA$, where R is the disk $x^2 + y^2 \le 9$

15. $\iint_R e^{-x^2-y^2}\, dA$, where R is the disk $x^2 + y^2 \le 4$

17. $\iint_R y\, dA$, where R is the disk $r = 2 - \cos\theta$

Use the most appropriate coordinate system to evaluate the double integral.

19. $\iint_R (x^2 + y^2)\, dA$, where R is bounded by $x^2 + y^2 = 9$

21. $\iint_R (x^2 + y^2)\, dA$, where R is bounded by $y = x$, $y = 0$ and $x = 2$

Use an appropriate coordinate system to compute the volume of the indicated solid.

23. Below $z = x^2 + y^2$, above $z = 0$, inside $x^2 + y^2 = 4$

25. Below $z = \sqrt{x^2 + y^2}$, above $z = 0$, inside $x^2 + y^2 = 4$

27. Below $z = \sqrt{1 - x^2 - y^2}$, above the xy-plane, inside $x^2 + y^2 = \frac{1}{4}$

Evaluate the iterated integral by converting to polar coordinates.

33. $\int_{-2}^{2} \int_{-\sqrt{4-x^2}}^{\sqrt{4-x^2}} \sqrt{x^2 + y^2}\, dy dx$

35. $\int_{0}^{2} \int_{-\sqrt{4-x^2}}^{\sqrt{4-x^2}} e^{-x^2-y^2}\, dy dx$

Compute the probability that a dart lands in the region *R*, assuming that the probability is given by $\iint_R \frac{1}{\pi} e^{-x^2-y^2}\, dA$.

39. A double bull's-eye, R is the region inside $r = ¼$ (inch)