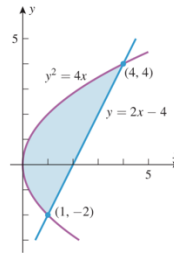


Section 6.1 – Area Between Two Curves

6. Find the area of the shaded region by:
- integrating with respect to x
 - integrating with respect to y



Sketch the region enclosed by the curves and find its area.

- $y = x^2, y = \sqrt{x}, x = \frac{1}{4}, x = 1$
- $y = \cos 2x, y = 0, x = \frac{\pi}{4}, x = \frac{\pi}{2}$
- $y = \sec^2 x, y = 2, x = -\frac{\pi}{4}, x = \frac{\pi}{4}$
- $y = 2 + |x - 1|, y = -\frac{1}{5}x + 7$

Find the equation which finds the area enclosed by the curves. Use a graphing utility, where helpful, to find the area of the region enclosed by the curves.

20. $y = x^3 - 4x^2 + 3x, y = 0$

21. $y = \sin x, y = \cos x, x = 0, x = 2\pi$

34. Use a CAS to find the area enclosed by the curves $y = x^5 - 2x^3 - 3x$ and $y = x^3$.

45. Two racers in adjacent lanes move with velocity functions $v_1(t)$ m/s and $v_2(t)$ m/s, respectively. Suppose that the racers are even at time $t=60$ s. Interpret the value of the integral $\int_0^{60} [v_2(t) - v_1(t)] dt$ in this context.

47. The two curves in the accompanying figure model the birth rates and death rates (in millions of people per year) for a country over a 50-year period. What does the area A between the curves over the interval [1960, 2010] represent? Justify your answer.

