Some Section 7.4 Even Homework Solutions

40. $y = 2\sqrt{x}$

$$y' = \frac{1}{\sqrt{x}}, \quad [4, 9]$$

$$S = 2\pi \int_4^9 2\sqrt{x}\sqrt{1 + \frac{1}{x}}\,dx$$

$$= 4\pi \int_4^9 \sqrt{x + 1}\,dx$$

$$= \frac{8}{3}\pi(x + 1)^{3/2}\Big]_4^9$$

$$= \frac{8\pi}{3}(10^{3/2} - 5^{3/2}) \approx 171.258$$

44. $y = 9 - x^2, \quad [0, 3]$

$$y' = -2x$$

$$S = 2\pi \int_0^3 x\sqrt{1 + 4x^2}\,dx$$

$$= \frac{\pi}{4} \int_0^3 (1 + 4x^2)^{1/2}(8x)\,dx$$

$$= \left[\frac{\pi}{6}(1 + 4x^2)^{3/2}\right]_0^3$$

$$= \frac{\pi}{6}(37^{3/2} - 1) \approx 117.319$$