$m = f(1) = 1$ and its absolute maximum on $[1, 4]$ is $M = f(4) = \sqrt{4} = 2$. Thus, Property 8 gives

$$1(4-1) \leqslant \int_1^4 \sqrt{x}\,dx \leqslant 2(4-1)$$

or

$$3 \leqslant \int_1^4 \sqrt{x}\,dx \leqslant 6$$

□

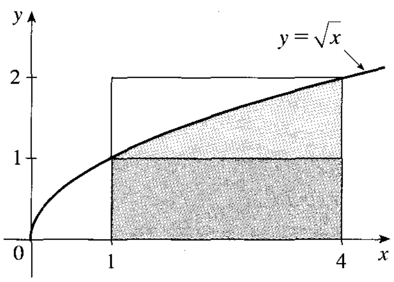

FIGURE 17

The result of Example 8 is illustrated in Figure 17. The area under $y = \sqrt{x}$ from 1 to 4 is greater than the area of the lower rectangle and less than the area of the large rectangle.

5.2 Exercises

13. If you have a CAS that evaluates midpoint approximations

27–28 □ Express the integral as a limit of sums. Then evaluate

$\int_0^1 (5 - 6x^2)\,dx$.