

**For each problem compute the solution in seven different ways:**

- (a) Find the exact solution, if possible, by evaluating symbolically.
- (b) Find a numeric approximation by using the approximation command in the context menu.
- (c) Find a numeric approximation by using the Right Rectangle Rule.
- (d) Find a numeric approximation by using the Left Rectangle Rule.
- (e) Find a numeric approximation by using the Midpoint Rule.
- (f) Find a numeric approximation by using the Trapezoidal Rule.
- (g) Find a numeric approximation by using Simpson's Rule.

**Note:** For parts (c)-(g), you must input an appropriate summation yourself using the summation symbol rather than using the tutor or a command. You should use  $n = 50$ . Display each approximation to ten digits. If you wish, you may check your answers by using either the Riemann Sums tutor or *Maple's* *RiemannSum* command.

1. Find the area under the graph of  $f$  defined by

$$f(x) = \frac{\sqrt{3 + \cos x}}{x + 4} \text{ for } x \in [0, \pi].$$

2. Find the total distance traveled by a particle in ten minutes, starting at  $t = 0$ , which moves on a linear path when the velocity of the particle in meters per second is given by

$$v(t) = \sqrt{2t} \sin\left(\sqrt[5]{t+1}\right).$$

State each solution in a complete sentence with the answer rounded to the nearest meter.