Calculus

Name: Date:

4A.2 Exercises

Sigma Notation

In Exercises 1–6, find the sum. Use the summation capabilities of a graphing utility to verify your result.

1. $\sum_{i=1}^{6}(3i + 2)$

3. $\sum_{k=0}^{4}\frac{1}{k^2 + 1}$

In Exercises 15–22, use the properties of summation and Theorem 4.2 to evaluate the sum. Use the summation capabilities of a graphing utility to verify your result.

15. $\sum_{i=1}^{12}7$

18. $\sum_{i=1}^{16}(5i - 4)$

19. $\sum_{i=1}^{20}(i - 1)^2$

22. $\sum_{i=1}^{10}i(i^2 + 1)$

In Exercises 23 and 24, use the summation capabilities of a graphing utility to evaluate the sum. Then use the properties of summation and Theorem 4.2 to verify the sum.

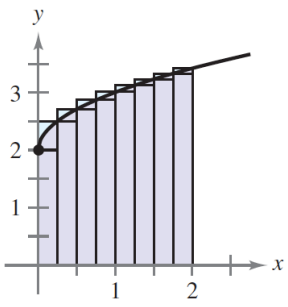
23. $\sum_{i=1}^{20} (i^2 + 3)$

In Exercises 27–32, use left and right endpoints and the given number of rectangles to find two approximations of the area of the region between the graph of the function and the x-axis over the given interval.

29. $g(x) = 2x^2 - x - 1, [2, 5]$, 6 rectangles

In Exercises 41–44, use upper and lower sums to approximate the area of the region using the given number of subintervals (of equal width).

42. $y = \sqrt{x} + 2$



In Exercises 45–48, use the summation formulas to rewrite the expression without the summation notation. Use the result to find the sums for $n = 10, 100, 1000$, and 10,000.

Remember, n should be considered as a constant.

45. $\sum_{i=1}^{n} \frac{2i + 1}{n^2}$

48. $\sum_{i=1}^{n} \frac{4i^2(i - 1)}{n^4}$

In Exercises 49–54, find a formula for the sum of n terms. Use the formula to find the limit as $n \to \infty$.

49. $\lim_{n\to\infty} \sum_{i=1}^{n} \frac{24i}{n^2}$

51. $\lim_{n\to\infty} \sum_{i=1}^{n} \frac{1}{n^3}(i - 1)^2$