



Name:

Date:

2B.1 Exercises

Basic Differentiation Rules

Use the rules of differentiation to find the derivative of the function.

5. $y = x^7$

7. $y = \frac{1}{x^5}$

9. $f(x) = \sqrt[5]{x}$

12. $g(x) = 3x - 1$

41. $g(t) = t^2 - \frac{4}{t^3}$

45. $f(x) = \frac{x^3 - 3x^2 + 4}{x^2}$

49. $f(x) = \sqrt{x} - 6\sqrt[3]{x}$

50. $f(x) = \sqrt[3]{x} + \sqrt[5]{x}$

51. $h(s) = s^{4/5} - s^{2/3}$

In Exercises 55–58,

- (a) find an equation of the tangent line to the graph of f at the given point,
- (b) use a graphing utility to graph the function and its tangent line at the point, and
- (c) use the *derivative* feature of a graphing utility to confirm your results.

55. $y = x^4 - 3x^2 + 2$

Point: (1,0)

56. $y = x^3 + x$

Point (-1,-2)

57. $f(x) = \frac{2}{\sqrt[4]{x^3}}$

Point (1,2)

Use the rules of differentiation to find the derivative of the function.

19. $y = \frac{\pi}{2} \sin \theta - \cos \theta$

21. $y = x^2 - \frac{1}{2} \cos x$

Find the slope of the graph of the function at the given point.

Use the *derivative* feature of a graphing utility to confirm your results.

37. $f(\theta) = 4 \sin \theta - \theta$ Point (0,0)

38. $g(t) = -2 \cos t + 5$ Point (π , 7)

Determine the point(s) (if any) at which the graph of the function has a horizontal tangent line.

59. $y = x^4 - 2x^2 + 3$