

Section 2.1 Techniques for Finding

Minimum homework: 1 – 19 odds, 21, 25, 29, 33,35, 37, 41, 45

#1-20: Use the Power rule to find the derivative of each function (write each answer with positive exponents)

1) $f(x) = 3x^2 + 4x - 7$

2) $g(x) = 2x^5 - 5x^3 + 3x - 4$

3) $y = 5x^3 + 3x + 1$

4) $y = 6x^3 + x^2 + 21$

5) $y = 9x^2 + 5x - 4$

6) $y = 12x^2 - 3x - 4$

7) $f(x) = 18$

8) $h(x) = -14$

9) $y = 3\sqrt{x}$

10) $y = 12\sqrt[3]{x}$

11) $g(x) = 6\sqrt{x}$

12) $f(x) = 14\sqrt{x}$

13) $f(x) = 3x^{2/3}$

14) $g(x) = 10x^{1/2}$

15) $f(x) = x^{1/3}$

16) $f(x) = x^{1/5}$

17) $y = \frac{3}{x^2}$

18) $y = \frac{5}{x^3}$

19) $f(x) = \frac{-3}{x}$

20) $f(x) = \frac{-5}{x}$

#21-32: Clear the parenthesis and then find the derivative of each function.

21) $y = (2x + 3)(3x - 4)$

22) $y = (3x - 4)(5x - 8)$

23) $f(x) = (x - 2)(3x - 4)$

24) $y = (x - 5)(3x^2 + 7)$

25) $f(x) = (x^2 + 3x + 2)(3x - 5)$

26) $f(x) = (3x^2 + 6x - 2)(4x + 1)$

27) $g(t) = (2t - 1)(3t + 5)$

28) $g(t) = (3t^2 + 5t)(2t + 1)$

29) $y = 3x^2(2x^2 + 6x - 4)$

30) $y = 4x^3(3x^2 + 7x - 5)$

31) $f(x) = (5x^2)(4x)$

32) $f(x) = (7x^2)(6x)$

#33-40: Rewrite the problem without a fraction and find the derivative of each function.

33) $f(x) = \frac{3x^2 + 6x}{2x}$

34) $f(x) = \frac{4x^3 + 6x^2 + 10}{2x}$

35) $y = \frac{x^2 + 2x}{x}$

36) $y = \frac{x^2 + 4x}{x}$

37) $f(x) = \frac{24x^2 + 12x + 60}{12}$

38) $f(x) = \frac{25x^2 + 5x + 15}{5}$

39) $f(x) = \frac{5x^2 + 6x + 1}{x^2}$

40) $f(x) = \frac{3x^2 - x + 1}{x^2}$

#41-44:

- a) Find the slope of the tangent line to the graph of the function for the given value of x .
- b) Find the equation of the tangent line to the graph of the function for the given value of x .

41) $f(x) = 3x^2 + 6x - 2$; $x = 2$

42) $f(x) = 2x^2 - 6x - 2$; $x = 3$

43) $f(x) = 9x^3 - 12x^2 + 5$; $x = 3$

44) $f(x) = 10x^3 - 5x^2 + 3$; $x = 4$

#45-48:

- a) Find all values of x where the tangent line is horizontal
- b) Find the equation of the tangent line to the graph of the function for the values of x found in part a.

45) $f(x) = 3x^2 + 6x + 2$

46) $f(x) = 2x^2 - 8x + 7$

47) $f(x) = -4x^2 + 24x - 9$

48) $f(x) = -2x^2 + 12x + 3$