

OPMT 5701 THE DERIVATIVE
RULES 1 TO 3

Problems 1–74, differentiate the functions.

1. $f(x) = 5$
2. $f(x) = \left(\frac{11}{13}\right)^{4/5}$
3. $y = x^6$
4. $f(x) = x^{21}$
5. $y = x^{80}$
6. $y = x^{5.3}$
7. $f(x) = 9x^2$
8. $y = 4x^3$
9. $g(w) = 4w^5$
10. $v(x) = x^e$
11. $y = \frac{2}{3}x^4$
12. $f(p) = \sqrt{3}p^4$
13. $f(t) = \frac{t^7}{25}$
14. $y = \frac{x^3}{3}$
15. $f(x) = x + 3$
16. $f(x) = 3x - 2$
17. $f(x) = 4x^2 - 2x + 3$
18. $F(x) = 5x^2 - 9x$
19. $g(p) = p^4 - 3p^3 - 1$
20. $f(t) = -13t^2 + 14t + 1$
21. $y = -x^8 + x^5$
22. $y = -8x^4 + \ln 2$
23. $y = -13x^3 + 14x^2 - 2x + 3$
24. $V(r) = r^8 - 7r^6 + 3r^2 + 1$
25. $f(x) = 2(13 - x^4)$
26. $\phi(s) = 3(s^6 - 2)$
27. $g(x) = \frac{13 - x^4}{3}$
28. $f(x) = \frac{5(x^4 - 6)}{2}$
29. $h(x) = 4x^4 + x^3 - \frac{9x^2}{2} + 8x$
30. $k(x) = -2x^2 + \frac{5}{3}x + 11$
31. $f(x) = \frac{3x^4}{10} + \frac{7}{3}x^3$
32. $p(x) = \frac{x^7}{7} + \frac{2x}{3}$
33. $f(x) = x^{7/2}$
34. $f(x) = 2x^{-14/5}$
35. $y = x^{3/4} + 2x^{5/3}$
36. $y = 5x^3 - x^{-2/5}$
37. $y = 11\sqrt{x}$
38. $y = \sqrt[3]{x^3}$
39. $f(r) = 6\sqrt[3]{r}$
40. $y = 4\sqrt[8]{x^2}$
41. $f(x) = x^{-4}$
42. $f(s) = 2s^{-3}$
43. $f(x) = x^{-3} + x^{-5} - 2x^{-6}$
44. $f(x) = 100x^{-3} + 10x^{1/2}$
45. $y = \frac{1}{x}$
46. $f(x) = \frac{2}{x^3}$
47. $y = \frac{8}{x^5}$
48. $y = \frac{1}{4x^5}$
49. $g(x) = \frac{4}{3x^3}$
50. $y = \frac{6}{3x^5}$
51. $f(t) = \frac{1}{2t}$
52. $g(x) = \frac{7}{9x}$
53. $f(x) = \frac{x}{7} + \frac{7}{x}$
54. $\Phi(x) = \frac{x^3}{3} - \frac{3}{x^3}$
55. $f(x) = -9x^{1/3} + 5x^{-2/5}$
56. $f(z) = 3z^{1/4} - 12z^2 - 8z^{-3/4}$
57. $q(x) = \frac{1}{\sqrt[3]{x}}$
58. $f(x) = \frac{3}{\sqrt[4]{x^3}}$
59. $y = \frac{2}{\sqrt{x}}$
60. $y = \frac{1}{2\sqrt{x}}$
61. $y = x^2\sqrt{x}$
62. $f(x) = x^2(4x^3)$
63. $f(x) = x(3x^2 - 10x + 7)$
64. $f(x) = x^3(3x^6 - 5x^2 + 4)$
65. $f(x) = x^3(3x)^2$
66. $s(x) = \sqrt[3]{x}(\sqrt[4]{x} - 6x + 3)$
67. $v(x) = x^{-2/3}(x + 5)$
68. $f(x) = x^{3/5}(x^2 + 7x + 11)$
69. $f(q) = \frac{4q^3 + 7q - 4}{q}$
70. $f(w) = \frac{w - 5}{w^5}$
71. $f(x) = (x + 1)(x + 3)$
72. $f(x) = x^2(x - 2)(x + 4)$
73. $w(x) = \frac{x^2 + x^3}{x^2}$
74. $f(x) = \frac{5x^4 + x^2}{12\sqrt{x}}$