

MATH 11012 Practice Differentiation Problems

1. $f(x) = 2x^4 - 3x^2 + 5x + 2$

2. $f(x) = x^{-\frac{1}{2}} + x^{\frac{1}{2}} - 6x^{\frac{1}{3}} + 3$

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

4. $f(x) = x^2 - 3x^{\frac{7}{3}} - 5x^{-2} - 4$

5. $f(x) = x^4 - 8x^3 + 2x^2 - x + 1$

6. $f(x) = 7x^{\frac{1}{3}} - 5x^2 + 3x - 17$

7. $f(x) = 9x^{-3} + 2x^{-\frac{1}{2}} - 14$

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

9. $f(x) = 12x^4 + 3x^3 + 5x^{-2} - 4$

10. $f(x) = 3x^3 + 2x^{\frac{4}{3}} - x + 1$

11. $f(x) = x + 1 + \frac{1}{x^2}$

12. $f(x) = \sqrt{x} - \frac{1}{\sqrt{x}}$

13. $f(x) = \frac{12}{x} - \frac{4}{x^3} + \frac{1}{x^4}$

14. $f(x) = \sqrt[3]{x} + \frac{1}{x^4}$

15. $f(x) = 4x^{-2} - 7\sqrt{x} + 8x^3 + 5$

16. $f(x) = \sqrt{x} + 3 + \frac{4}{x}$

17. $f(x) = -3x^{-3} + 4x^2 + \frac{1}{x^2}$

18. $f(x) = 4x^{-3} + \frac{2}{\sqrt{x}} + 5$

19. $f(x) = 3\sqrt[3]{x} - \frac{4}{x^5} - 6x + 2$

20. $f(x) = 7x^4 - \frac{3}{x^2} + \frac{8}{\sqrt{x}}$

21. $f(x) = (x^3 + 7x^2 + 5)^5$

22. $f(x) = \sqrt{x^4 + x^2 + 2}$

23. $f(x) = \sqrt{x^2 + 2x + 3}$

24. $f(x) = (x^3 - 3x)^4$

25. $f(x) = (2x^3 - 3)^{\frac{2}{3}}$

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

27. $f(x) = \sqrt{3x^2 + 1}$

28. $f(x) = (2x - 5)^{10}$

29. $f(x) = (6x - 5)^{-3}$

30. $f(x) = (4x^2 - 5x + 3x^{-1})^4$

31. $f(x) = (x^2 + 3x - 2)^{-2}$

32. $f(x) = (3x^2 + 13x - 4)^{-\frac{3}{4}}$

33. $f(x) = \sqrt[3]{(x^2 + 2)^2}$

34. $f(x) = \frac{1}{\sqrt{4x^2 - 3x + 5}}$

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

36. $f(x) = (x^4 - 3x^2 + 5)(3x^4 - x^{-2})$

37. $f(x) = (x^3 - 3x^{-2} + x)(x^{-6} + 6x - 2)$

38. $f(x) = (2x + 5)(3x^2 - 6x - 11)$

39. $f(x) = (2x^3 - 3x^2 + x^{-3})(4x^2 - 6x + 1)$

40. $f(x) = (4x^{-1} + 3x^{-3})(2x^{\frac{1}{2}} + 6x^{\frac{3}{4}} + 2)$

41. $f(x) = (7x^2 + 6x - 2)(4x^{-\frac{1}{3}} - 6x^{-\frac{2}{5}})$

42. $f(x) = (3x^2 + 2x - 1)(x^3 - 1)$

43. $f(x) = x\sqrt{1 - x^2}$

44. $f(x) = x^2\sqrt{x - 2}$

45. $f(x) = (\sqrt{x + 1})(x^2 + 1)$

46. $f(x) = (2x - 4)(3x^2 + 2)^5$

47. $f(x) = (2x - 3)^3(4x + 2)^6$

48. $f(x) = (7x + 3)^2(3x^2 - 14x + 5)^{\frac{1}{2}}$

49. $f(x) = (8x^3 - 2)(3x^2 - 5x + 10)^4$

50. $f(x) = (2x - 3)^6(3x + 4)$

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

52. $f(x) = (\frac{1}{x} + 3)(x^2 - 5)^{\frac{1}{3}}$

53. $f(x) = (2x + 1)^4(x^2 + 2)^3$

54. $f(x) = 3(4x^2 + 2) + 5(2x - 1)^2$

55. $f(x) = 7x(4x - 9)^2$

56. $f(x) = \frac{x^2 + x + 1}{x^2 + 1}$

57. $f(x) = \frac{2x + 3}{3x + 2}$

58. $f(x) = \frac{2x + 1}{3x - 5}$

59. $f(x) = \frac{x^2 + 5x - 1}{7}$

60. $f(x) = \frac{5}{x^3 + 6x^2 - 23}$

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

62. $f(x) = \frac{x + x^3}{\sqrt{x}}$

63. $f(x) = \frac{10}{\sqrt{x} + 4}$

64. $f(x) = \frac{\sqrt{x}}{x + 1}$

65. $f(x) = \frac{8}{4 + x^2}$

66. $f(x) = \frac{3x^2 - 2x + 3}{4x^2 - 5}$

67. $f(x) = \frac{6x^2 - 2x + 5}{2x^2 + 7}$

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

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

70. $f(x) = \frac{x - 1}{x + 1}$

71. $f(x) = \frac{x^2}{x^2 + 1}$

72. $f(x) = \frac{1}{x^4 - 2x + 1}$

73. $f(x) = \frac{(x + 1)(x - 3)}{4x - 7}$

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

75. $f(x) = \frac{3 - \frac{1}{x}}{x + 5}$

$$76. f(x) = \left(\frac{x+1}{x-1}\right)^2$$

$$77. f(x) = \left(\frac{4x}{x^2+1}\right)^{\frac{1}{4}}$$

$$78. f(x) = \left(\frac{8x+3}{9x+1}\right)^5$$

$$79. f(x) = \left(\frac{1}{x^2+6x-1}\right)^7$$

$$80. f(x) = \left(\frac{x^2-7}{4x-13}\right)^{\frac{1}{4}}$$

$$81. f(x) = \left(\frac{x^3-8}{x^2+4}\right)^5$$

$$82. f(x) = \left(\frac{1}{x^3+1}\right)^{-4}$$

$$83. f(x) = \left(\frac{x^4-2x+1}{3x^2-4}\right)^{-7}$$

$$84. f(x) = \sqrt{\frac{3x-5}{4x^2-7}}$$

$$85. f(x) = \sqrt{\frac{2x-7}{4x+9}}$$

$$86. f(x) = \sqrt{\frac{x^2+1}{x^2+4}}$$

$$87. f(x) = \frac{(3x-2)^3}{2x+1}$$

$$88. f(x) = \frac{3x^5-6x^2+11}{(2x^2-8x+9)^8}$$

$$89. f(x) = \frac{4x^2}{\sqrt{x^2+3}}$$

$$90. f(x) = \frac{\sqrt{x^3+5}}{x}$$

$$91. f(x) = \frac{(7x^2+8)^5}{(5x-9)^4}$$

$$92. f(x) = \frac{(2x-7)^5}{(7x^2-1)^2}$$

$$93. f(x) = \frac{(x-1)^2}{(x+1)^5}$$

$$94. f(x) = \left(2x + \frac{1}{x}\right)^{-6}$$

$$95. f(x) = \left(7x^2 + \frac{1}{\sqrt{x}}\right)^4$$