I. Power Functions

A. Sums of Powers

1. $f(x) = 3x^5 - 2x^3 + 6x - 7$

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

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

4. $f(x) = x^2 - 5x^{8/5}$

5. $f(x) = x + 1 + \dfrac{1}{x^4}$

6. $f(x) = \sqrt[3]{x} - \dfrac{1}{\sqrt[3]{x}}$

7. $f(x) = \dfrac{12}{x} - \dfrac{2}{x^6} + \dfrac{6}{x^2}$

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

9. $f(x) = x^7 - 6x^4 + 3x^2 + x - 1$

10. $f(x) = 5x^3 + 3x^2 - 3x + 15$

11. $f(x) = 7x^{-4} + 6x^{-3} - 14$

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

13. $f(x) = 11x^3 + 4x^2 + 7x^{-2} + 8$

14. $f(x) = 5x^{-3} - 3\sqrt{x} + 6x^2 + 7$

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

16. $f(x) = 3x^4 - 5x^3 - 6x + 8$

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

18. $f(x) = x + 2 + \dfrac{6}{x}$

19. $f(x) = -2x^{-2} + 7x^2 + \dfrac{1}{x^3}$

20. $f(x) = x^{5/2} + \dfrac{1}{x^{3/2}}$

B. Products and Powers

21. $f(x) = (x^5 + 2x^4 + 3)^7$

22. $f(x) = \sqrt{x^6 + x^4 + 9}$

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

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

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

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

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

28. $f(x) = (3x - 7)^{12}$

29. $f(x) = (5x - 6)^{-4}$

30. $f(x) = x^3(x^2 - 4)$

31. $f(x) = \sqrt[3]{x^3 + 27}$

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

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

34. $f(x) = (x^4 + 3)(x^7 + 5x^3 + 2)$

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

36. $f(x) = x^{-6}(3x^2 + 5)$

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

38. $f(x) = (x^4 + 3x + 7)(x^9 + 4x + 5)$

39. $f(x) = \sqrt[5]{x^5 + 1}$

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

C. Quotients and Powers

41. $f(x) = \dfrac{x^3 + x + 1}{x^3 + 1}$

42. $f(x) = \dfrac{3x + 4}{4x + 3}$

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

44. $f(x) = \dfrac{x^4 + 4x - 1}{x^3}$

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

46. $f(x) = \dfrac{x + x^4}{\sqrt[3]{x}}$

47. $f(x) = \dfrac{8}{\sqrt{x} + 3}$

48. $f(x) = \dfrac{10}{5 + x^3}$

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

50. $f(x) = \dfrac{5x^3 - 3x + 7}{3x^2 + 5}$

51. $f(x) = \dfrac{3x - 2}{x^3 + 3x}$

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

53. $f(x) = \dfrac{x + 1}{x - 1}$

54. $f(x) = \dfrac{x^3}{x^3 + 2}$

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

56. $f(x) = 3x^2 + \dfrac{3 - x}{x^2}$

57. $f(x) = \dfrac{x^2 - 3}{x^3 + 2}$

58. $f(x) = \dfrac{\sqrt{x}}{x + x^4}$

59. $f(x) = \dfrac{\sqrt{x} + 3}{\sqrt{x} - 3}$

60. $f(x) = \dfrac{x^4}{\sqrt{x} + 3}$

D. Products, Quotients, and Composites

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

62. $f(x) = x^2 \sqrt{1 - x^4}$

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

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

65. $f(x) = (2x + 7)^3 (2x^3 - 15x + 4)^{1/3}$

66. $f(x) = (3x^8 - 5)(2x^3 - 7x + 11)^5$

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

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

69. $f(x) = \left(\dfrac{1}{x} + 2\right)(x^3 - 2)^{1/2}$

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

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

72. $f(x) = (\sqrt{x^4 + 1})(\sqrt[3]{x^6 + 1})$

73. $f(x) = [(x^2 + 3)(x^5 + 2)]^8$

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

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

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

77. $f(x) = \left(\dfrac{x - 1}{x + 1}\right)^5$

78. $f(x) = \left(\dfrac{3x}{x^4 + 1}\right)^{1/3}$

79. $f(x) = \dfrac{2}{\sqrt{3x + 1}}$

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

81. $f(x) = \dfrac{7}{\sqrt[3]{x^5 + 2}}$

82. $f(x) = x^5 \cdot \left(\dfrac{x^3 + 1}{x^3 - 1}\right)$

83. $f(x) = \left(\dfrac{x^2 + 5x + 3}{x^2 + 3x + 5}\right)^{-4}$

84. $f(x) = \left(\dfrac{5x}{x^5 + 3}\right)^{-1/3}$

85. $f(x) = \dfrac{(x + 2)^3 (x + 4)^5}{(x + 6)^7}$

86. $f(x) = \dfrac{(x^5 + 2)(x + 3)^2}{(x + 4)}$

87. $f(x) = \dfrac{(x^4 + 2)^3}{(x^3 + 2)^5}$

88. $f(x) = \left(\dfrac{x - 5}{x + 5}\right)^{-3}$

89. $f(x) = \dfrac{\sqrt{x^2 + 1}}{\sqrt[4]{x^4 + 1}}$

90. $f(x) = \dfrac{x^2 + 3}{\sqrt[3]{1 - x^3}}$

II. Trigonometric Functions

A. Trigonometric and Power Functions

91. $f(x) = \sin(x^3 + 3)$

92. $f(x) = \sin(5x)$

93. $f(x) = \cos(7x)$

94. $f(x) = \cos(x^2 + 5)$

95. $f(x) = \tan(x^3 + 7)$

96. $f(x) = \sec(2x + 3)$

97. $f(x) = 3\tan x - \sec x$

98. $f(x) = 2 + x - \sin x$

99. $f(x) = \sec(3x - x^2)$

100. $f(x) = \tan(2x^3 - 3x + 2)$

101. $f(x) = \cos(3x - \pi)$

102. $f(x) = 5\sin(x^2) + 2\cos(x) - \cos(2)$

103. $f(x) = 3\cos x - 2\sin x$

104. $f(x) = -\tan(\pi x - 3)$

105. $f(x) = \sin(2x) - \sec(2x)$

106. $f(x) = x^3 \tan x$

107. $f(x) = \cos(3x + 2)$

108. $f(x) = \cos(2\pi x)$

109. $f(x) = \cos\left(\dfrac{1}{\sqrt{x}}\right)$

110. $f(x) = \tan\left(\dfrac{1}{x}\right)$

111. $f(x) = \sin(-x)$

112. $f(x) = \sec(\frac{1}{2} - \pi x)$

113. $f(x) = \tan(x^2 + 1)$

114. $f(x) = \sec(5x)$

115. $f(x) = x\sin x$

116. $f(x) = x\tan(3x)$

117. $f(x) = x^3 \tan\left(\dfrac{3}{x}\right)$

118. $f(x) = 5\sec(3x) - 4\cos(2x)$

119. $f(x) = (x^3 + 2)\cos x$

120. $f(x) = x^2 \sin(x^3 + 1)$

124. $f(x) = \cos^2(3x) + \sin^2(7x)$

125. $f(x) = \cos^3\left(x + \dfrac{1}{x}\right)$

126. $f(x) = \cos^3(x - 2)$

127. $f(x) = \sin^4(x^3 - x)$

128. $f(x) = (\cos x)(\sin^3 x)$

129. $f(x) = 5\sec^4(3 - 7x)$

130. $f(x) = \cos^4(4x) + 3\cos(4x) + \pi$

131. $f(x) = 3\sin x + 2\sin^5 x$

132. $f(x) = 2\tan^3 x + 3\tan^2 x - 5$

133. $f(x) = 2\cos^3(x + 3) + 2\cos(x + 3) - 4$

134. $f(x) = 2x^4 - 2\sec^2 x + \cos x$

135. $f(x) = \cos^2 x + \sin^2 x$

136. $f(x) = (\sin x + \cos x)\tan x$

137. $f(x) = 2(\cos x)(\tan x)$

138. $f(x) = (\sin^2 x)\sec x$

139. $f(x) = x + \sec^3 x$

140. $f(x) = (\sec x)(\cos x)$

141. $f(x) = (\tan^5 x)\sec x$

142. $f(x) = \sin^3 x + \sin(x^3)$

143. $f(x) = (\cos x)(\sin x)(\sec x)$

144. $f(x) = (\cos^2 x)(\sin^3 x)$

145. $f(x) = (\tan^3 x)(\sec^2 x)$

146. $f(x) = (\cos x)(\tan x + \sec x)$

147. $f(x) = 7(\tan x)(\sin x)$

148. $f(x) = \sin^2 x - \cos^2 x$

149. $f(x) = 4\sec^6(5x)$

150. $f(x) = \tan^2 x - \sec^2 x$

B. Products and Trigonometric Functions

121. $f(x) = 3\tan^2(4x)$

122. $f(x) = \sin^3(x^2)$

123. $f(x) = \cos(4x)\sin(7x)$

C. Quotients and Trigonometric Functions

151. $f(x) = \dfrac{\cos x}{x}$

152. $f(x) = \dfrac{\sin x}{\cos x}$

153. $f(x) = \dfrac{1}{\tan x}$

154. $f(x) = \dfrac{\sec x}{1 - \sec x}$

155. $f(x) = \dfrac{\cos x}{1 + x^4}$

156. $f(x) = \dfrac{1 - \tan x}{1 + \tan x}$

157. $f(x) = \dfrac{x^3}{\sec x}$

158. $f(x) = \dfrac{x}{\sin x}$

159. $f(x) = \dfrac{\cos x - 5}{\sin x + 5}$

160. $f(x) = \dfrac{\cos x + \sin x}{\tan x}$

161. $f(x) = x^3 - \dfrac{1}{\sin x}$

162. $f(x) = \dfrac{x^3 + 2}{\cos x + \sin x}$

163. $f(x) = \dfrac{\tan x}{\cos x}$

164. $f(x) = \dfrac{\sec x}{\sin x}$

165. $f(x) = \dfrac{1 + \sec x}{1 - \sec x}$

166. $f(x) = \dfrac{\sin x}{1 + \cos x}$

167. $f(x) = \dfrac{\cos(x^3 + 2)}{\tan x}$

168. $f(x) = \dfrac{\tan x}{\sec x}$

169. $f(x) = \dfrac{x^3 \cos x}{x^7 + 5}$

170. $f(x) = \dfrac{\cos(x^4)}{\cos^4 x}$

171. $f(x) = \dfrac{3x - \sec x}{3x + \sec x}$

172. $f(x) = \dfrac{\tan x + \cos x}{\sec x + \sin x}$

173. $f(x) = \dfrac{\tan x}{x^3}$

174. $f(x) = \dfrac{\cos(x^3 + 2)}{\sin(x^3 + 2)}$

175. $f(x) = \dfrac{5}{\sin(x^4)}$

176. $f(x) = \dfrac{1 + \cos x}{1 - \cos x}$

177. $f(x) = \dfrac{x^3 + \sin x}{x + \sin^3 x}$

178. $f(x) = \dfrac{\tan(x^3)}{\tan^3(x)}$

179. $f(x) = \dfrac{\sec(x^4)}{\sec^4 x}$

180. $f(x) = \dfrac{\sec^5 x}{x^5}$

D. Composites and Trigonometric Functions

181. $f(x) = \sec(\cos x)$

182. $f(x) = \sin(\sec x)$

183. $f(x) = \sqrt{\cos x}$

184. $f(x) = (\tan x - x \sin x)^{-1}$

185. $f(x) = \sqrt{\tan(3x)}$

186. $f(x) = \cos^{1/2}(3x)$

187. $f(x) = (\cos(x + 1))^{2/3}$

188. $f(x) = \cos \sqrt{x} + \sqrt{\cos x}$

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

190. $f(x) = (\cos x)\sqrt{\sin x}$

191. $f(x) = \cos(\sin x)$

192. $f(x) = (\cos x + \sec x)^{1/5}$

193. $f(x) = (\tan x)^{-7}$

194. $f(x) = \tan(\sec x)$

195. $f(x) = \cos^{1/3}(\sqrt[3]{x})$

196. $f(x) = \tan(\sin x + \cos x)$

197. $f(x) = \sin^{-4}(x^4)$

198. $f(x) = \sqrt{\sec x + \sin x}$

199. $f(x) = (x + \sin^2 x)^7$

200. $f(x) = \sin(1 + \sec^3 x)$