

Al-Saudia Virtual Academy
Pakistan Online Tuition – Online Tutor Pakistan

TRIGNOMETRIC FUNCTION

If

$$y = \sin x \quad \frac{dy}{dx} = \cos x$$

$$y = \cos x \quad \frac{dy}{dx} = -\sin x$$

$$y = \tan x \quad \frac{dy}{dx} = \sec^2 x$$

$$y = \cot x \quad \frac{dy}{dx} = -\operatorname{cosec}^2 x$$

$$y = \sec x \quad \frac{dy}{dx} = \sec x \tan x$$

$$y = \operatorname{cosec} x \quad \frac{dy}{dx} = -\operatorname{cosec} x \cot x$$

Use first principle –to derive above formulas.

QUESTION:-

1. $f(x) = 2 \cos x - 3 \sin x$
2. $\sin x \cos x$;
3. $\frac{\sin x}{x}$
4. $x^2 \cos x$;
5. $x^3 \sin x - 5 \cos x$
6. $\cos x / x \sin x$;
7. $\sec x - \sqrt{2} \tan x$
8. $(x^2 + 1) \sec x$;
9. $\sec x \tan x$
10. $\sec x / 1 + \tan x$;
11. $x^{-4} \csc x + 2 \cot x$
12. $\csc x \cot x$;
13. $\cot x / 1 + \csc x$

14. $\csc x / \tan x$;
15. $\sin^2 x + \cos^2 x$
16. $1/\cot x$;
17. $\sin x \cot x$
18. $\frac{\sec x}{1 + \tan x}$
19. $(x^2 + 1) \cot x / 3 - \cos x \csc x$
20. $x \sin x - 3 \cos x$;
21. $x^2 \cos x + 4 \sin x$
22. $\sin^2 x \cos x$;
23. $\cos x / 1 - \sin x$
24. $1/1 + \cos x$;
25. $\cos x / 2 - \sin x$
26. $1/\sin x \cos x$;
27. $\sin(2x)$;
28. $\cos(2x)$
29. $\tan(x^2 + 1)$;
30. $\tan^2(x^2 + 1)$
31. $\sqrt{x^3} + \csc x$;
32. $1 + x^5 \cot x$
33. $\cos^2 \pi x$;
34. $\sin \sqrt{1 + \cos x}$
35. $\sqrt{1 + \cos x}$;
36. $x^2 \sec \sqrt{x^2 + 9}$
37. $\sin^3(x^3)$;
38. $\cos^2 \sqrt{3x}$
39. $\tan^2(4x)$;
40. $3 \cot^4 x$;
41. $4 \cos^5 x$
42. $\sin(1/x^2)$;
43. $\tan^4(x^3)$;
44. $2 \sec^2(x^7)$
45. $\cos^3(x/x + 1)$;

46. $\sqrt{\cos(5x)}$
47. $\sqrt{3x - \sin^2(4x)}$;
48. $[x + \csc(x^3 + 3)]^{-3}$
49. $[x^4 - \sec(4x^2 - 2)]^{-4}$;
50. $x^3 \sin(5x)$
51. $\sqrt{x} \tan^3(\sqrt{x})$;
52. $x^5 \sec(1/x)$
53. $\sin x \sec(3x + 1)$;
54. $\cos(\cos x)$
55. $\sin(\tan(3x))$;
56. $\cos^3(\sin(2x))$
57. $(1 + \csc(x^2)) / (1 - \cot(x^2))$.
58. $[x \sin 2x + \tan^4(x^7)]^5$
59. $\sin(3x^2)$;
60. $x \ln(5x) - \sin^2 x$
61. $x \tan(1/x)$;
62. $x \cos 3x$
63. $\sin(1 + x^3)$;
64. $\sec^3(\pi/2 - x)$
65. $(x - 1/x)^3$; $\cos xy = y$
66. $\sin(x^2 y^2) = x$;
67. $x^2 = \cot y / (1 + \csc y)$
68. $\tan^3(xy^2 + y) = x$,
69. $xy^3 / (1 + \sec y) = 1 + y^4$
70. $\sqrt{1 + \sin^3(xy^2)} = y$
71. $\sqrt{3 + \tan xy} - = 0$
72. $y + \sin y = x$;
73. $x \cos y = y$
74. $y = \sin^3 x$;
75. $\sin^2(2x)$
76. $3 \sin x$;
77. $\sin 9x$;

78. $\cos x/2$;
79. $\cos x^2$
80. $\text{Sec}(0.6x)$;
81. $\text{coscc}(x/6)$;
82. $\sin(x^5)^5$
83. $\text{Sin } 2x + \cos 2x + \cos 2x$;
84. $\sin 3x - \cos 3x$
85. $\text{Sec}x + \tan x$;
86. $\sin 4x + \cos 5x$
87. $\text{Cos } \frac{1}{2} q + \sin \frac{1}{2} q$;
88. $\sin(2x + \pi/2)$
89. $\text{Cos}(3x - x)$;
90. $\text{Cos}(3\pi - x)$;
91. $\sin(x^3)^2$
92. $\cos^3(2x)$;
93. $\sec(x^2)$;
94. $\tan \sqrt{1 - x}$
95. $a \sin x + b \cos x$;
96. $a(1 - \cos x)$
97. $2 \tan(x/2)$;
98. $\cos(2x + \pi/2)$;
99. $\tan^2 x$
100. $x^2 + \frac{1}{2} \sin 1/2x$;
101. $\cos a/x$;
102. $x \sin x$
103. $\text{Cos } a/x$;
104. $x^3 \sin x$;
105. $x/\sin x$
106. $x \tan x$;
107. $x/\tan x$;
108. $\tan x/x$
109. $\text{Sin}(2x) + \sin(2x)^3$;
110. $\cos^3(x^2)$

111. $x^2 \tan x$;
112. $\cot (5x + 1)$;
113. $\cot^2 3x$
114. $\sqrt{\cos x}$;
115. $\sin^2 x \cos^2 x$;
116. $\sqrt{x}/\sin x$
117. $\sin^2 x + \cos^2 x$;
118. $\sin^2 x$
119. $\frac{1}{1+\cos x}$
120. $(1-\cos x)/(1 + \cos x)$
121. $x^2 \cos x$;
122. $x^2/\cos 2x$;
123. $\tan x - 1/\sec x$
124. $x \sqrt{\sin x}$;
125. $\sin^2 x / 1 + \sin x$
126. $1/1 - \tan x$;
127. $\sec^2 x \operatorname{cosec} x$
128. $e^x \sin x$;
129. $e^{\sin x}$;
130. $e^{\cos x}$;
131. $e^{\tan x}$
132. $\ln (\sin x)$;
133. $\ln (\cos x)$;
134. $\ln (\tan x/2)$
135. $e^{-kx} \sin (kx)$;
136. $\ln (\sqrt{\sin x})$
137. $e^{ax} \cos (bx + c)$;
138. $e^{-ax} \cos (3x)$
139. $e^{-1/2x}$;
140. $\sin (\pi x + \pi /2)$
141. $\ln [\cos x / \sqrt{4 - 3x^2}]$
142. $\ln [\sqrt{x} 3\sqrt{x + 1} / \sin x \operatorname{csc} x]$

143. $Y = (\sin x \cos x \tan^3 x) / \sqrt{x}$
144. $e^x \tan x$;
145. $e^{\ln(x^3 + 1)} \cdot \sin x$
146. $\ln(\cos e^x)$;
147. $e^{ax} \cos bx$
148. $\pi \sin x^{\sin x}$;
149. $\pi^{\sin x}$;
150. $\pi^{x \tan x}$
151. $(\ln x)^{\tan x}$
152. $e^{\tan x} \cdot \sec^2 x$;
153. $e^{\sin x} \cdot \cos x$
154. $\sin(e^{\cos x})$;
155. $\cos(e^{\sin x})$;
156. $\cos(e^{x \sin x})$
157. $e^x \sin(1 + e^x)$;
158. $e^{-x} \sec^2(2 - e^{-x})$
159. $\pi^{\sin x} \cdot \cos x$;
160. $\pi \cos x \cdot \sin x$ Type equation here.
161. $x \ln x - 4 \pi e^x \cos x$
162. $e^{2 \ln x}$
163. $\sin 7x - \cos 5x$;
164. $\tan(x^5)$;
165. $\tan^2(x^5)$
166. $\cot(1 - 2x^2)$;
167. $x^3 \sin x$;
168. \cos^x / x^2
169. $3 \cos q - \cos 3q$;
170. $3 \sin q - \sin 3q$
171. $3 \tan q - \sec^3 q$
172. $3 \sec q + \tan 3q$
173. $x \sec^2(4x - 5)$;
174. $\cos \sqrt{x} / \sqrt{x}$

175. $\frac{1}{3} \sin 3x + 5$;
176. $\sec y + 4x$
177. $\tan 2x + \sec^2 x + x^2 - x + 3$
178. $\frac{1}{3} \sin^3 x + 5$;
179. $-\frac{1}{2} \cot (2x) + 5$
180. $\frac{1}{2} \tan (x^2) + 9$;
181. $\sec^2 x / 1 + \tan x$
182. $\cos^4 x \sin x$;
183. $x \sec^2 (x)^2$;
184. $\csc^2 (2x)$
185. $\sec 3x \tan 3x$;
186. $\sin^2 x \cos^2 x$
187. $\sin (x/5)$;
188. $\ln / (\sec x + \tan x)$
189. $\ln (\cos (2x))$;
190. $\cos (\ln (2x))$
191. $\ln (\ln (\tan x))$;
192. $\ln \sin (5x)$
193. $\frac{1}{3} \ln (1 - \cos 3x)$;
194. $\ln (\ln x^2)$
195. $3 \sec^2 (3x) \csc^{\tan 3x}$;
196. $-e^{-x} (\cos x + \sin x)$
197. $-2x (\ln 3)^{3-x^2}$;
198. $e^x / \sqrt{1 - e^{2x}}$
199. $2 \tan x - x / 2x - \sin x$;
200. $\ln \sec (2x) / \ln \sec x$
201. $\ln \cot x / e^{\csc x^2}$;
202. $x \csc x$;
203. $\csc \pi x \ln x$
204. $(e^x - 1) \cos x$;
205. $\sec^3 x - \tan^3 x$
206. $((\sin x - \cos x)^{\tan x})$;
207. $(\cos x)^{1/x}$;

208. $1 - e^x / 1 - x$
209. $E^{-\tan x} \sec^2 x$;
210. $x^{\tan \frac{1}{2} x}$; $e^{\sec 2x}$
211. $1/3 \operatorname{csc} 3x$;
212. $- \frac{1}{2} \cot 2x$;
213. $\frac{1}{2} \tan (x^2)$
214. $\tan x - x$;
215. $- 1/5 \cos^5 x$
216. $\ln \sin 5x$;
217. $\sin 3x / 1 - \cos 3x$
218. $\ln(\operatorname{csc} x - \cot x)$
219. $\sin 6x / \sin 8x$;
220. $\tan 7x / \sin 3x$
221. $\sin^2 Q / Q$;
222. $h / \tan h$;
223. $\sin^x / -\cos x$
224. $X^2 / (1 - \cos x)$;
225. $x / (\cos (1/2\pi - x))$
226. $q / \cos q$;
227. $t^2 / (1 - \cos^2 t)$;
228. $1 - \cos 5x / \cos 7x - 1$
229. $X^2 - 3 \sin x / x$;
230. $2x + \sin x / x$