

$$6.105. y = \cos x - \frac{1}{3} \cos^3 x.$$

$$6.107. y = \operatorname{tg}^4 \sqrt{x}.$$

$$6.109. y = e^{ax} (a \sin x - \cos x).$$

$$6.111. y = \cos^2 \sqrt{\frac{1}{x}}.$$

$$6.113. y = \frac{\sin^2 x}{\cos^7 x} - \frac{2}{5 \cos^5 x}.$$

$$6.115. y = \sqrt{\sin x + \sqrt{x + 2\sqrt{x}}}.$$

$$6.117. z = \frac{3 \operatorname{tg} u - \operatorname{tg}^3 u}{1 - 3 \operatorname{tg}^2 u}.$$

$$6.119. y = (4 \sin x - 8 \sin^3 x) \cos x.$$

$$6.120. y = \operatorname{arctg} 3x.$$

$$6.122. x = \arcsin(1 - t).$$

$$6.124. x = \arcsin \sqrt{t^3}.$$

$$6.126. y = \arcsin x + \arcsin \sqrt{1 - x^2}, \quad 0 < x < 1.$$

$$6.127. x = \arcsin 2t \sqrt{1 - t^2}.$$

$$6.129. y = \operatorname{arctg} \sqrt{x^2 - 1} - \frac{\ln x}{\sqrt{x^2 - 1}}.$$

$$6.131. y = \frac{1}{5} x^5 \operatorname{arctg} x - \frac{1}{20} x^4 + \frac{1}{10} x^2 - \frac{1}{10} \ln(1 + x^2).$$

$$6.132. y = \arcsin \frac{x}{\sqrt{1 + x^2}}.$$

$$6.134. y = \operatorname{arctg} \sqrt{\frac{1 - x}{1 + x}}.$$

$$6.136. y = \operatorname{arctg} \frac{x}{1 + \sqrt{1 + x^2}}.$$

$$6.138. y = \frac{\operatorname{arctg} 2x}{\operatorname{arctg} 2x}.$$

$$6.106. y = \frac{1}{3} \sin^3 x - \frac{2}{5} \sin^5 x + \frac{1}{7} \sin^7 x.$$

$$6.108. y = 3 \operatorname{ctg} x + \operatorname{ctg}^3 x.$$

$$6.110. y = x^2 e^{2x} \sin x.$$

$$6.112. y = 2 \sin^3 \sqrt{\frac{3}{x}}.$$

$$6.114. y = \frac{3 \cos^2 x}{\sin^3 x}.$$

$$6.116. y = \sqrt{1 + \operatorname{tg} \left( x + \frac{1}{x} \right)}.$$

$$6.118. z = \operatorname{tg} u - \operatorname{ctg} u - 2u.$$

$$6.121. y = 7 \operatorname{arctg} \frac{1}{2} x.$$

$$6.123. x = \arccos \sqrt{1 - t^2}.$$

$$6.125. x = \arcsin \frac{1}{t}.$$

$$6.128. y = \operatorname{arctg} (x - \sqrt{x^2 + 1}).$$

$$6.130. y = x \operatorname{arctg} x - \frac{1}{2} \ln(x^2 + 1).$$

$$6.133. y = \arccos \sqrt{\frac{1 - x^2}{1 + x^2}}.$$

$$6.135. y = \operatorname{arctg} \frac{1 + x}{1 - x}, \quad x \neq 1.$$

$$6.137. y = \operatorname{arctg} \frac{\sqrt{1 + x^2} - 1}{x}.$$

$$6.139. z = \sqrt{\frac{1 - \arcsin y}{1 + \arcsin y}}.$$

6.140.  $y = x^3 \operatorname{arctg} x^3.$

6.141.  $z = \frac{\arcsin 4y}{1-4y}.$

6.142.  $y = \frac{4}{\sqrt{3}} \operatorname{arctg} \left[ \frac{1}{\sqrt{3}} \left[ 2 \operatorname{tg} \frac{x}{2} + 1 \right] \right] - x.$

6.143.  $y = \frac{1}{\sqrt{a^2 - b^2}} \arcsin \frac{a \cos x + b}{a + b \cos x}.$

6.144.  $y = e^{3x}.$

6.145.  $y = 5e^{\frac{1}{2}x}.$

6.146.  $y = e^x f(x).$

6.147.  $y = 3e^{-2x} g(x).$

6.148.  $y = e^{\sin x}.$

6.149.  $y = 5e^{\cos x}.$

6.150.  $y = e^{\cos^2 x}.$

6.151.  $y = 3e^{2\sin^3 x}.$

6.152.  $z = (v^3 - 3v^2 + 6v - 6) e^v.$

6.153.  $z = (10x^2 - 1) e^{3x}.$

6.154.  $z = \frac{(2x-1)e^x}{2\sqrt{x}}.$

6.155.  $y = (x + k\sqrt{1-x^2}) e^{k \arcsin x}.$

6.156.  $y = 5^x + 2^x.$

6.157.  $y = 3^x x^3.$

6.158.  $y = 2 \cdot 7^x - 1.$

6.159.  $y = 5 \cdot 10^{3x}.$

6.160.  $y = a^{2x} x^n, \quad a > 0.$

6.161.  $y = \ln 3x.$

6.162.  $y = 7 \cdot 5^{10x}.$

6.163.  $z = \ln \frac{30}{x+3}.$

6.164.  $y = 5 \ln 10x.$

6.165.  $s = \ln(t + \sqrt{t^2 + 1}).$

6.166.  $z = 3 \ln \frac{5}{x-2}.$

6.167.  $s = \ln \sqrt{\frac{1+t}{1-t}}.$

6.168.  $y = 2 \ln \frac{3}{t + \sqrt{t^2 - 4}}.$

6.169.  $y = \ln |\ln |x||.$

6.170.  $y = \ln \left( \frac{a + b \operatorname{tg} x}{a - b \operatorname{tg} x} \right).$

6.171.  $y = \ln \operatorname{tg} \left( \frac{1}{4}\pi + \frac{1}{2}x \right), \quad 0 < x < \frac{1}{2}\pi.$

6.172.  $y = \ln (\cos \frac{1}{2}x)^2.$

6.173.  $y = \ln \sqrt{\frac{1 + \sin x}{1 - \sin x}}.$

6.174.  $y = 15 \ln \operatorname{tg} \frac{1}{2}x + \frac{\cos x}{\sin^4 x} (8 \cos^4 x - 25 \cos^2 x + 15).$

6.175.  $y = \ln (\ln (\ln x)), \quad x > e.$

6.176.  $y = \ln \frac{\sqrt{x^2 + 1} - x}{\sqrt{x^2 + 1} + x}.$

$$6.177. y = \ln \sin x. \quad 6.178. y = \ln \frac{1 + \sqrt{x}}{1 - \sqrt{x}}, \quad 0 \leq x < 1.$$

$$6.179a. y = \ln \left( 1 + \frac{a}{x} \right). \quad 6.179b. y = \ln (e^{mx} + e^{-mx}).$$

$$6.180. y = \log_x \ln x. \quad \text{Wskazówka. } y = \frac{\ln(\ln x)}{\ln x}.$$

$$6.181. y = \log_x a. \quad \text{Wskazówka. } \log_x a = \frac{\ln a}{\ln x}.$$

$$6.182. y = x^{5x}, \quad x > 0. \quad 6.183. y = 10x^{-3x}, \quad x > 0.$$

$$6.184. y = x^{\sin x}, \quad x > 0. \quad 6.185. y = 3x^{\cos x}, \quad x > 0.$$

$$6.186. y = \left( \frac{a}{x} \right)^x, \quad a > 0, \quad x > 0. \quad 6.187. y = x^{\frac{1}{x}}, \quad x > 0.$$

$$6.188. y = a^{\ln x}, \quad a > 0, \quad x > 0. \quad 6.189. y = 5^{\ln 2x}, \quad x > 0.$$

$$6.190. y = x^{\frac{1}{\ln x}}, \quad x > 0; \text{ wyjaśnić wynik.}$$

$$6.191. y = (\sin x)^{\cos x}, \quad 0 < x < \frac{1}{2}\pi. \quad 6.192. y = (\arctg x)^x, \quad x > 0.$$

$$6.193. y = (\tg x)^{\sin x}, \quad 0 < x < \frac{1}{2}\pi. \quad 6.194. y = (\tg x)^{\frac{1}{\cos x}}, \quad 0 < x < \frac{1}{2}\pi.$$

$$6.195. y = (\cos x)^{\ctg x}, \quad 0 < x < \frac{1}{2}\pi. \quad 6.196. y = e^{e^x}.$$

$$6.197. y = x^{e^x}, \quad x > 0. \quad 6.198. y = x^{x^x}, \quad x > 0.$$

$$6.199. y = \left( 1 + \frac{1}{x} \right)^x. \quad 6.200. y = x^{\sqrt{\frac{1}{x}}}.$$

Dane są równania określające ruch punktu; znaleźć prędkość ruchu w danym momencie  $t$  (zad. 6.201 - 6.204):

$$6.201. s = 3t^{-\frac{1}{2}}, \quad t = \frac{1}{4}. \quad 6.202. s = 10\sqrt{t^3}, \quad t = 4.$$

$$6.203. s = 8\sqrt[3]{2t^5}, \quad t = 2. \quad 6.204. s = \sqrt{3t}, \quad t = 2.$$

6.205. Obliczyć kąt, który tworzy z osią  $Ox$  styczna do linii  $y = \sin x$  w początku współrzędnych.

6.206. Jaki kąt z osią  $Ox$  tworzy linia  $y = \ctg x$  w punkcie  $x = \frac{1}{2}\pi$ ?

6.207. W jakim punkcie styczna do linii  $y = (x-8)/(x+1)$  tworzy z osią  $Ox$  kąt równy połowie kąta prostego?

6.208. Znaleźć na linii  $y = e^x$  punkt, w którym styczna jest równoległa do prostej  $x - y + 7 = 0$ .