





(1)  $\frac{1}{x^2} = x^{-2}$   $\frac{d}{dx} x^{-2} = -2x^{-3} = -\frac{2}{x^3}$

(2)  $\frac{1}{x^3} = x^{-3}$   $\frac{d}{dx} x^{-3} = -3x^{-4} = -\frac{3}{x^4}$

(3)  $\frac{1}{x^4} = x^{-4}$   $\frac{d}{dx} x^{-4} = -4x^{-5} = -\frac{4}{x^5}$

(4)  $\frac{1}{x^5} = x^{-5}$   $\frac{d}{dx} x^{-5} = -5x^{-6} = -\frac{5}{x^6}$

(5)  $\frac{1}{x^6} = x^{-6}$   $\frac{d}{dx} x^{-6} = -6x^{-7} = -\frac{6}{x^7}$

(6)  $\frac{1}{x^7} = x^{-7}$   $\frac{d}{dx} x^{-7} = -7x^{-8} = -\frac{7}{x^8}$

(7)  $\frac{1}{x^8} = x^{-8}$   $\frac{d}{dx} x^{-8} = -8x^{-9} = -\frac{8}{x^9}$

(8)  $\frac{1}{x^9} = x^{-9}$   $\frac{d}{dx} x^{-9} = -9x^{-10} = -\frac{9}{x^{10}}$

(9)  $\frac{1}{x^{10}} = x^{-10}$   $\frac{d}{dx} x^{-10} = -10x^{-11} = -\frac{10}{x^{11}}$

**10.  $\frac{d}{dx} \ln x$  و  $\frac{d}{dx} \log_a x$  را بیابید.**

9.  $\frac{d}{dx} \ln x = \frac{1}{x}$  و  $\frac{d}{dx} \log_a x = \frac{1}{x \ln a}$

(1)  $\frac{d}{dx} \ln x = \frac{1}{x}$

(2)  $\frac{d}{dx} \log_2 x = \frac{1}{x \ln 2}$

(3)  $\frac{d}{dx} \log_3 x = \frac{1}{x \ln 3}$

(4)  $\frac{d}{dx} \log_4 x = \frac{1}{x \ln 4}$

(5)  $\frac{d}{dx} \log_5 x = \frac{1}{x \ln 5}$

(6)  $\frac{d}{dx} \log_6 x = \frac{1}{x \ln 6}$

(7)  $\frac{d}{dx} \log_7 x = \frac{1}{x \ln 7}$

(8)  $\frac{d}{dx} \log_8 x = \frac{1}{x \ln 8}$

(9)  $\frac{d}{dx} \log_9 x = \frac{1}{x \ln 9}$

(10)  $\frac{d}{dx} \log_{10} x = \frac{1}{x \ln 10}$

(11)  $\frac{d}{dx} \log_{11} x = \frac{1}{x \ln 11}$

(12)  $\frac{d}{dx} \log_{12} x = \frac{1}{x \ln 12}$

(13)  $\frac{d}{dx} \log_{13} x = \frac{1}{x \ln 13}$

(14)  $\frac{d}{dx} \log_{14} x = \frac{1}{x \ln 14}$

(15)  $\frac{d}{dx} \log_{15} x = \frac{1}{x \ln 15}$

(16)  $\frac{d}{dx} \log_{16} x = \frac{1}{x \ln 16}$

(17)  $\frac{d}{dx} \log_{17} x = \frac{1}{x \ln 17}$

(18)  $\frac{d}{dx} \log_{18} x = \frac{1}{x \ln 18}$

(19)  $\frac{d}{dx} \log_{19} x = \frac{1}{x \ln 19}$

(20)  $\frac{d}{dx} \log_{20} x = \frac{1}{x \ln 20}$

(21)  $\frac{d}{dx} \log_{21} x = \frac{1}{x \ln 21}$

(22)  $\frac{d}{dx} \log_{22} x = \frac{1}{x \ln 22}$

(23)  $\frac{d}{dx} \log_{23} x = \frac{1}{x \ln 23}$

(24)  $\frac{d}{dx} \log_{24} x = \frac{1}{x \ln 24}$

(25)  $\frac{d}{dx} \log_{25} x = \frac{1}{x \ln 25}$

(26)  $\frac{d}{dx} \log_{26} x = \frac{1}{x \ln 26}$

(27)  $\frac{d}{dx} \log_{27} x = \frac{1}{x \ln 27}$

(28)  $\frac{d}{dx} \log_{28} x = \frac{1}{x \ln 28}$

(29)  $\frac{d}{dx} \log_{29} x = \frac{1}{x \ln 29}$

(30)  $\frac{d}{dx} \log_{30} x = \frac{1}{x \ln 30}$

**11.  $\frac{d}{dx} \ln |x|$  و  $\frac{d}{dx} \ln |x-a|$  را بیابید.**

10.  $\frac{d}{dx} \ln |x| = \frac{1}{x}$  و  $\frac{d}{dx} \ln |x-a| = \frac{1}{x-a}$

(1)  $\frac{d}{dx} \ln |x| = \frac{1}{x}$

(2)  $\frac{d}{dx} \ln |x-1| = \frac{1}{x-1}$

(3)  $\frac{d}{dx} \ln |x+1| = \frac{1}{x+1}$

(4)  $\frac{d}{dx} \ln |x-2| = \frac{1}{x-2}$

(5)  $\frac{d}{dx} \ln |x+2| = \frac{1}{x+2}$

(6)  $\frac{d}{dx} \ln |x-3| = \frac{1}{x-3}$

(7)  $\frac{d}{dx} \ln |x+3| = \frac{1}{x+3}$

(8)  $\frac{d}{dx} \ln |x-4| = \frac{1}{x-4}$

(9)  $\frac{d}{dx} \ln |x+4| = \frac{1}{x+4}$

**11.  $\frac{d}{dx} \ln |x^2|$  و  $\frac{d}{dx} \ln |x^2-a^2|$  را بیابید.**

(1)  $\frac{d}{dx} \ln |x^2| = \frac{2}{x}$

(2)  $\frac{d}{dx} \ln |x^2-1| = \frac{2x}{x^2-1}$

(3)  $\frac{d}{dx} \ln |x^2+1| = \frac{2x}{x^2+1}$

(4)  $\frac{d}{dx} \ln |x^2-4| = \frac{2x}{x^2-4}$

(5)  $\frac{d}{dx} \ln |x^2+4| = \frac{2x}{x^2+4}$

(6)  $\frac{d}{dx} \ln |x^2-9| = \frac{2x}{x^2-9}$

(7)  $\frac{d}{dx} \ln |x^2+9| = \frac{2x}{x^2+9}$

(8)  $\frac{d}{dx} \ln |x^2-16| = \frac{2x}{x^2-16}$

(9)  $\frac{d}{dx} \ln |x^2+16| = \frac{2x}{x^2+16}$

(10)  $\frac{d}{dx} \ln |x^2-25| = \frac{2x}{x^2-25}$

(11)  $\frac{d}{dx} \ln |x^2+25| = \frac{2x}{x^2+25}$

(12)  $\frac{d}{dx} \ln |x^2-36| = \frac{2x}{x^2-36}$

(13)  $\frac{d}{dx} \ln |x^2+36| = \frac{2x}{x^2+36}$

(14)  $\frac{d}{dx} \ln |x^2-49| = \frac{2x}{x^2-49}$

(15)  $\frac{d}{dx} \ln |x^2+49| = \frac{2x}{x^2+49}$

(16)  $\frac{d}{dx} \ln |x^2-64| = \frac{2x}{x^2-64}$

(17)  $\frac{d}{dx} \ln |x^2+64| = \frac{2x}{x^2+64}$

(18)  $\frac{d}{dx} \ln |x^2-81| = \frac{2x}{x^2-81}$

(19)  $\frac{d}{dx} \ln |x^2+81| = \frac{2x}{x^2+81}$

(20)  $\frac{d}{dx} \ln |x^2-100| = \frac{2x}{x^2-100}$

(21)  $\frac{d}{dx} \ln |x^2+100| = \frac{2x}{x^2+100}$

(22)  $\frac{d}{dx} \ln |x^2-121| = \frac{2x}{x^2-121}$

(23)  $\frac{d}{dx} \ln |x^2+121| = \frac{2x}{x^2+121}$

(24)  $\frac{d}{dx} \ln |x^2-144| = \frac{2x}{x^2-144}$

(25)  $\frac{d}{dx} \ln |x^2+144| = \frac{2x}{x^2+144}$

(26)  $\frac{d}{dx} \ln |x^2-169| = \frac{2x}{x^2-169}$

(27)  $\frac{d}{dx} \ln |x^2+169| = \frac{2x}{x^2+169}$

(28)  $\frac{d}{dx} \ln |x^2-196| = \frac{2x}{x^2-196}$

(29)  $\frac{d}{dx} \ln |x^2+196| = \frac{2x}{x^2+196}$

(30)  $\frac{d}{dx} \ln |x^2-225| = \frac{2x}{x^2-225}$

(31)  $\frac{d}{dx} \ln |x^2+225| = \frac{2x}{x^2+225}$

(32)  $\frac{d}{dx} \ln |x^2-256| = \frac{2x}{x^2-256}$

(33)  $\frac{d}{dx} \ln |x^2+256| = \frac{2x}{x^2+256}$

(34)  $\frac{d}{dx} \ln |x^2-289| = \frac{2x}{x^2-289}$

(35)  $\frac{d}{dx} \ln |x^2+289| = \frac{2x}{x^2+289}$

(36)  $\frac{d}{dx} \ln |x^2-324| = \frac{2x}{x^2-324}$

(37)  $\frac{d}{dx} \ln |x^2+324| = \frac{2x}{x^2+324}$

(38)  $\frac{d}{dx} \ln |x^2-361| = \frac{2x}{x^2-361}$

(39)  $\frac{d}{dx} \ln |x^2+361| = \frac{2x}{x^2+361}$

(40)  $\frac{d}{dx} \ln |x^2-400| = \frac{2x}{x^2-400}$

(41)  $\frac{d}{dx} \ln |x^2+400| = \frac{2x}{x^2+400}$

(42)  $\frac{d}{dx} \ln |x^2-441| = \frac{2x}{x^2-441}$

(43)  $\frac{d}{dx} \ln |x^2+441| = \frac{2x}{x^2+441}$

(44)  $\frac{d}{dx} \ln |x^2-484| = \frac{2x}{x^2-484}$

(45)  $\frac{d}{dx} \ln |x^2+484| = \frac{2x}{x^2+484}$

(46)  $\frac{d}{dx} \ln |x^2-529| = \frac{2x}{x^2-529}$

(47)  $\frac{d}{dx} \ln |x^2+529| = \frac{2x}{x^2+529}$

(48)  $\frac{d}{dx} \ln |x^2-576| = \frac{2x}{x^2-576}$

(49)  $\frac{d}{dx} \ln |x^2+576| = \frac{2x}{x^2+576}$

(50)  $\frac{d}{dx} \ln |x^2-625| = \frac{2x}{x^2-625}$

(51)  $\frac{d}{dx} \ln |x^2+625| = \frac{2x}{x^2+625}$

(52)  $\frac{d}{dx} \ln |x^2-676| = \frac{2x}{x^2-676}$

(53)  $\frac{d}{dx} \ln |x^2+676| = \frac{2x}{x^2+676}$

(54)  $\frac{d}{dx} \ln |x^2-729| = \frac{2x}{x^2-729}$

(55)  $\frac{d}{dx} \ln |x^2+729| = \frac{2x}{x^2+729}$

(56)  $\frac{d}{dx} \ln |x^2-784| = \frac{2x}{x^2-784}$

(57)  $\frac{d}{dx} \ln |x^2+784| = \frac{2x}{x^2+784}$

(58)  $\frac{d}{dx} \ln |x^2-841| = \frac{2x}{x^2-841}$

(59)  $\frac{d}{dx} \ln |x^2+841| = \frac{2x}{x^2+841}$

(60)  $\frac{d}{dx} \ln |x^2-900| = \frac{2x}{x^2-900}$

(61)  $\frac{d}{dx} \ln |x^2+900| = \frac{2x}{x^2+900}$

(62)  $\frac{d}{dx} \ln |x^2-961| = \frac{2x}{x^2-961}$

(63)  $\frac{d}{dx} \ln |x^2+961| = \frac{2x}{x^2+961}$

(64)  $\frac{d}{dx} \ln |x^2-1024| = \frac{2x}{x^2-1024}$

(65)  $\frac{d}{dx} \ln |x^2+1024| = \frac{2x}{x^2+1024}$

(66)  $\frac{d}{dx} \ln |x^2-1089| = \frac{2x}{x^2-1089}$

(67)  $\frac{d}{dx} \ln |x^2+1089| = \frac{2x}{x^2+1089}$

(68)  $\frac{d}{dx} \ln |x^2-1156| = \frac{2x}{x^2-1156}$

(69)  $\frac{d}{dx} \ln |x^2+1156| = \frac{2x}{x^2+1156}$

(70)  $\frac{d}{dx} \ln |x^2-1225| = \frac{2x}{x^2-1225}$

(71)  $\frac{d}{dx} \ln |x^2+1225| = \frac{2x}{x^2+1225}$

(72)  $\frac{d}{dx} \ln |x^2-1296| = \frac{2x}{x^2-1296}$

(73)  $\frac{d}{dx} \ln |x^2+1296| = \frac{2x}{x^2+1296}$

(74)  $\frac{d}{dx} \ln |x^2-1369| = \frac{2x}{x^2-1369}$

(75)  $\frac{d}{dx} \ln |x^2+1369| = \frac{2x}{x^2+1369}$

(76)  $\frac{d}{dx} \ln |x^2-1444| = \frac{2x}{x^2-1444}$

(77)  $\frac{d}{dx} \ln |x^2+1444| = \frac{2x}{x^2+1444}$

(78)  $\frac{d}{dx} \ln |x^2-1521| = \frac{2x}{x^2-1521}$

(79)  $\frac{d}{dx} \ln |x^2+1521| = \frac{2x}{x^2+1521}$

(80)  $\frac{d}{dx} \ln |x^2-1600| = \frac{2x}{x^2-1600}$

(81)  $\frac{d}{dx} \ln |x^2+1600| = \frac{2x}{x^2+1600}$

(82)  $\frac{d}{dx} \ln |x^2-1681| = \frac{2x}{x^2-1681}$

(83)  $\frac{d}{dx} \ln |x^2+1681| = \frac{2x}{x^2+1681}$

(84)  $\frac{d}{dx} \ln |x^2-1764| = \frac{2x}{x^2-1764}$

(85)  $\frac{d}{dx} \ln |x^2+1764| = \frac{2x}{x^2+1764}$

(86)  $\frac{d}{dx} \ln |x^2-1849| = \frac{2x}{x^2-1849}$

(87)  $\frac{d}{dx} \ln |x^2+1849| = \frac{2x}{x^2+1849}$

(88)  $\frac{d}{dx} \ln |x^2-1936| = \frac{2x}{x^2-1936}$

(89)  $\frac{d}{dx} \ln |x^2+1936| = \frac{2x}{x^2+1936}$

(90)  $\frac{d}{dx} \ln |x^2-2025| = \frac{2x}{x^2-2025}$





