Find y':

(1) $y = \ln(3 - \sqrt{x})$

(2) $y = \ln\left(\dfrac{1+2x}{1-3x}\right)$

(3) $y = \sqrt{\ln(x) + 4x}$

(4) $y = (x^2 + 2x)\ln(x^2)$

(5) $y = 3x\Big(\ln\left(2x - x^2\right)\Big)^2$

(6) $y = \sqrt[3]{x + \ln(x)}$

(7) $y = \dfrac{x-2}{x + \ln(x)}$

(8) $y = \dfrac{3}{1 + 2e^{3x}}$

(9) $y = \sqrt{2x + e^x}$

(10) $y = x^2 e^{1-x}$

(11) $y = e^{x^2 - 2x}$

(12) $y = \ln\Big(2(x+1)e^{3x}\Big)$

(13) $y = \ln\left(\dfrac{e^{3-x}}{x-2}\right)$

(14) $y = \ln(\sqrt{x} - 1)$

(15) $y = \ln\left(\dfrac{4x-1}{2x-1}\right)$

(16) $y = \sqrt{5x + \ln(x) - 1}$

(17) $y = \left(3x - x^2\right)\ln(3 - 2x)$

(18) $y = 2x\Big(\ln\left(x^3 + 2\right)\Big)^3$

(19) $y = \sqrt[5]{x - 2\ln(x)}$

(20) $y = \dfrac{4-x}{x^2 + \ln(x)}$

(21) $y = \dfrac{4}{1 - 3e^{2x}}$

(22) $y = \sqrt{2x^2 + e^x}$

(23) $y = \left(x^2 + 1\right)e^{2-x}$

(24) $y = e^{x^3 - 3}$

(25) $y = \ln\Big(\left(x^2 + 1\right)e^{2-x}\Big)$

(26) $y = \ln\left(\dfrac{x+4}{e^{x+2}}\right)$

Find y':

(27) $x + y^2 + \ln(2x - y) = 2$

(28) $\ln\left(y^2\right) + x^3 = \ln\left(3x^2 - 2\right)$

(29) $e^{y^2 - 1} + e^{x - 2y} = 2(x - y)$

(30) $\ln\Big((x-1)e^y\Big) + x = 2e^{3y}$

(31) $e^{xy} + y^2 = 3e^x - y$

(32) $\ln(y - x) + 6x^2 = y^2 + 2$

(33) $\ln\left(x^2\right) + y^2 = \ln(2 - y) + 1$

(34) $e^{2x+y} - 2x^2 = y + e^{2+y}$

(35) $y^2 + e^{3x^2 + \ln(y)} = 2\ln(x + y)$

(36) $2e^y + 3x^2 = 4e^{x-1} + x$

(37) $e^{xy} - xe^y + 2ye^x + 3x - 4 = 0$

(38) $\ln(xy) + 4\sqrt{x} - \dfrac{x}{\sqrt{y}} + 3\ln(y) - 3 = 0$

(39) $\sqrt{3e^x + e^y} - \ln\left(\dfrac{x+1}{y+1}\right) + 3x^2 - 2y^2 - 2 = 0$

(40) $e^{\sqrt{y} - 1} + \ln\left(\dfrac{y+1}{\sqrt{x}}\right) + 4\sqrt{x} - 5 = 0$

(41) $3x\sqrt{y} - 4\ln\left(\dfrac{x}{y}\right) + 4x^3 - 5y - 2 = 0$

(42) $y = xe^{2x}$ find $\dfrac{d^3y}{dx^3}$ (43) $y = x\ln(x)$ find $\dfrac{d^3y}{dx^3}$

(44) $y = \dfrac{2x}{e^x}$ find $\dfrac{d^3y}{dx^3}$ (45) $y = \dfrac{\ln(x)}{3x}$ find $\dfrac{d^3y}{dx^3}$

(46) $y = \left(x^2+4\right)e^x$ find $\dfrac{d^3y}{dx^3}$ (47) $y = \left(x^2+1\right)\ln(x)$ find $\dfrac{d^3y}{dx^3}$

(48) $y = \dfrac{\ln\left(\sqrt{x}\right)}{x^2}$ find $\dfrac{d^3y}{dx^3}$ (49) $y = \ln\left(e^x+3\right)$ find $\dfrac{d^3y}{dx^3}$

(50) $y = e^{\sqrt{x}+1}$ find $\dfrac{d^2y}{dx^2}$ (51) $y = \ln\left(\sqrt{x^3+3}\right)$ find $\dfrac{d^2y}{dx^2}$

Find y':

(52) $y = \left(2x^3-x\right)^{x-2}$ (53) $y = \left(x^2-8\right)^{x^2}$ (54) $y = \left(5-x^2\right)^{x+1}$

(55) $y = \left(2+x^3\right)^{x^3}$ (56) $y = \left(3e^x+x^2\right)^{3x+1}$ (57) $y = \left(2\ln(x)+3\right)^{2x}$

(58) $y = \left(x^2+4\right)^{e^x}$ (59) $y = \left(2\sqrt{x}+1\right)^{e^{(x-1)}}$ (60) $y = \left(x^3+1\right)^{2+\ln(x)}$

ANSWERS:

(1) $\dfrac{-1}{2\sqrt{x}(3-\sqrt{x})}$ (2) $\dfrac{2}{1+2x}+\dfrac{3}{1-3x}$ (3) $\dfrac{1+4x}{2x\sqrt{\ln(x)+4x}}$

(4) $(2x+2)\ln\left(x^2\right)+2x+4$ (5) $3\Big(\ln\left(2x-x^2\right)\Big)^2+\dfrac{6x(2-2x)\ln\left(2x-x^2\right)}{2x-x^2}$ (6) $\dfrac{x+1}{3x\left(x+\ln(x)\right)^{2/3}}$

(7) $\dfrac{\ln(x)+1+\frac{2}{x}}{\left(x+\ln(x)\right)^2}$ (8) $\dfrac{-18e^{3x}}{\left(1+2e^{3x}\right)^2}$ (9) $\dfrac{2+e^x}{2\sqrt{2x+e^x}}$ (10) $\left(2x-x^2\right)e^{1-x}$

(11) $(2x-2)e^{x^2-2x}$ (12) $\dfrac{1}{x+1}+3$ (13) $-1-\dfrac{1}{x-2}$ (14) $\dfrac{1}{2\sqrt{x}\left(\sqrt{x}+1\right)}$

(15) $\dfrac{4}{4x-1}-\dfrac{2}{2x-1}$ (16) $\dfrac{5x+1}{2x\sqrt{5x+\ln(x)-1}}$ (17) $(3-2x)\ln(3-2x)-\dfrac{2\left(3x-x^2\right)}{3-2x}$

(18) $2\Big(\ln\left(x^3+2\right)\Big)^3+\dfrac{18x^3\Big(\ln\left(x^3+2\right)\Big)^2}{x^3+2}$ (19) $\dfrac{x-2}{5x\left(x-2\ln(x)\right)^{4/5}}$ (20) $\dfrac{x^2-\ln(x)-8x-\frac{4}{x}+1}{\left(x^2+\ln(x)\right)^2}$

(21) $\dfrac{24e^{2x}}{\left(1-3e^{2x}\right)^2}$ (22) $\dfrac{4x+e^x}{2\sqrt{2x^2+e^x}}$ (23) $\left(-x^2+2x-1\right)e^{2-x}$ (24) $3x^2e^{x^3-3}$

(25) $\dfrac{2x}{x^2+1}-1$ (26) $\dfrac{1}{x+4}-1$ (27) $\dfrac{y-2x-2}{4xy-2y^2-1}$ (28) $\dfrac{3xy}{3x^2-2}-\dfrac{3x^2y}{2}$

(29) $\dfrac{2-e^{x-2y}}{2ye^{y^2-1}-2e^{x-2y}+2}$ (30) $\dfrac{\frac{1}{x-1}+1}{6e^{3y}-1}$ (31) $\dfrac{(3-y)e^x}{xe^y+2y+1}$ (32) $\dfrac{12x^2-12xy+1}{2xy-2y^1+1}$

(33) $\dfrac{\frac{2}{x}}{\frac{1}{y-2}-2y}$ (34) $\dfrac{4x-2e^{2x+y}}{e^{2x+y}-e^{2+y}-1}$ (35) $\dfrac{\frac{2}{x+y}-6xye^{3x^2}}{2y+e^{3x^2}-\frac{2}{x+y}}$ (36) $\dfrac{4e^{x-1}+1-6x}{2e^y}$

(37) $\dfrac{e^y-ye^{xy}-3}{xe^{xy}-xe^y}$ (38) $\dfrac{\frac{1}{\sqrt{y}}-\frac{2}{\sqrt{x}}-\frac{1}{x}}{\frac{4}{y}+\frac{x}{2y^{3/2}}}$ (39) $\dfrac{\frac{1}{x+1}-\frac{3e^x}{2\sqrt{3e^x+e^y}}-6x}{\frac{1}{y+1}+\frac{e^y}{2\sqrt{3e^x+e^y}}-4y}$ (40) $\dfrac{\frac{1}{2x}+\frac{2}{\sqrt{x}}}{\frac{e\sqrt{y}-1}{\sqrt{y}}+\frac{1}{y+1}}$

(41) $\dfrac{\frac{4}{x}-12x^2-3\sqrt{y}}{\frac{3x}{2\sqrt{y}}+\frac{4}{y}-5}$ (42) $(12+8x)e^{2x}$ (43) $\dfrac{-1}{x^2}$ (44) $\dfrac{6-2x}{e^x}$ (45) $\dfrac{11-6\ln(x)}{3x^4}$

(46) $\left(x^2+6x+10\right)e^x$ (47) $\dfrac{2x^2+2}{x^3}$ (48) $\dfrac{13+12\ln(x)}{x^5}$ (49) $\dfrac{-3e^{2x}+9e^x}{\left(e^x+3\right)^3}$

(50) $\dfrac{e^{\sqrt{x}+1}(\sqrt{x}-1)}{4x\sqrt{x}}$ (51) $\dfrac{-3x^4+18x}{2\left(x^3+3\right)^3}$

(52) $\left(2x^3-x\right)^{x-2}\left[\ln\left(2x^3-x\right)+\dfrac{(x-2)(6x^2-1)}{2x^3-x}\right]$ (53) $\left(x^2-8\right)^{x^2}\left[2x\ln\left(x^2-8\right)+\dfrac{2x^3}{x^2-8}\right]$

(54) $\left(5-x^2\right)^{x+1}\left[\ln\left(5-x^2\right)-\dfrac{2x^2+2x}{5-x^2}\right]$ (55) $\left(2+x^3\right)^{x^3}\left[3x^2\ln\left(2+x^3\right)+\dfrac{3x^5}{2+x^3}\right]$

(56) $\left(3e^x+x^2\right)^{3x+1}\left[3\ln\left(3e^x+x^2\right)+\dfrac{(3x+1)(3e^x+2x)}{3e^x+x^2}\right]$

(57) $\left(2\ln(x)+3\right)^{2x}\left[2\ln\left(2\ln(x)+3\right)+\dfrac{4}{\ln(x)+3}\right]$ (58) $\left(x^2+4\right)^{e^x}e^x\left[\ln\left(x^2+4\right)+\dfrac{2x}{x^2+4}\right]$

(59) $\left(2\sqrt{x}+1\right)^{e^{(x-1)}}e^{x-1}\left[\ln\left(2\sqrt{x}+1\right)+\dfrac{1}{2x+\sqrt{x}}\right]$

(60) $\left(x^3+1\right)^{2+\ln(x)}\left[\dfrac{\ln\left(x^3+1\right)}{x}+\dfrac{3x^2\left(2+\ln(x)\right)}{x^3+1}\right]$