There is one solution that is wrong | which one?

Math 106, Sec [redacted]
Fall [redacted] 2005

"Solutions to Practice Problems"

(1) $\frac{dy}{dx} = 4(x+x^3e^x)^3\left[1+x^3e^x+3x^2e^x\right]$

(2) $y' = 15\left(\frac{x+\sqrt{x}}{x^2-2^x}\right)^{14}\cdot\frac{(x^2-2^x)\left(1+\frac{1}{2\sqrt{x}}\right)-(x+\sqrt{x})(2x-(\ln 2)2^x)}{(x^2-2^x)^2}$.

(3) $y' = \frac{1}{2\sqrt{1+\sqrt{1+\sqrt{x}}}}\cdot\frac{1}{2\sqrt{1+\sqrt{x}}}\cdot\frac{1}{2\sqrt{x}}$.

(4) $y' = 50\left[\pi+x(x^3+5)^{31}\right]^{49}\left[31x(x^3+5)^{30}(3x^2)+(x^3+5)^{31}\right]$.

(5) $y' = \frac{(xe^x-1)\left[\frac{2x}{2\sqrt{x^2+1}}\right]-\left[1+\sqrt{x^2+1}\right]\left[xe^x+e^x\right]}{(xe^x-1)^2}$.

(5)* $y = x^x = e^{x\ln x} \Rightarrow y' = e^{x\ln x}\cdot\left[x\cdot\frac{1}{x}+\ln x\right] = x^x\left[1+\ln x\right]$.

(6) $y' = \sqrt{x}\,e^{x(x+1)^7}\cdot\left[7x(x+1)^6+(x+1)^7\right]+\frac{1}{2\sqrt{x}}e^{x(x+1)^7}$.

(7) $y' = \left(e^{\frac{1}{x}}-1\right)^5e^x+5e^x\left(e^{\frac{1}{x}}-1\right)^4\cdot\left(e^{\frac{1}{x}}\right)\left(-\frac{1}{x^2}\right)$.

(8) $y' = -\left[\sin(x^2)\right]\left[\sin(e^x)\right](e^x)+\left[\cos(e^x)\right]\left[\cos(x^2)\right](2x)$.

(9) $y' = \left[\sec^2\left(\left[\frac{x+1}{x-1}\right]^2\right)\right](2)\cdot\frac{x+1}{x-1}\cdot\frac{(x-1)-(x+1)}{(x-1)^2}$

(10) $y' = \left(\sin^2(5x)\right)(3)\left[\tan^2(4x)\right]\left[\sec^2(4x)\right](4)+\left[\tan^3(4x)\right](2)\left[\sin(5x)\right]\left[\cos(5x)\right](5)$.

(11) $y' = \frac{(\sqrt{x}+1)\frac{3}{1+9x^2}-\left[\tan^{-1}(3x)\right]\frac{1}{2\sqrt{x}}}{(\sqrt{x}+1)^2}$.

(12) $y' = \frac{x^3\frac{1}{2\sqrt{x}}}{\sqrt{1-x}}+3x^2\sin^{-1}(\sqrt{x})+\sec x\tan x$.

(13) $y' = 5\left(x\ln(x^2+1)\right)^4\left[x\frac{2x}{x^2+1} + \ln(x^2+1)\right]$.

(14) $y' = \sin x \cdot \frac{\cos x}{\sin x} + (\cos x)\ln|\sin x|$.

(15) $y' = \dfrac{(x+\ln 2x)\left(\frac{1}{x}+\frac{1}{2\sqrt{x}}\right) - \left(\ln x + \sqrt{x}\right)\left(1+\frac{2}{2x}\right)}{(x+\ln 2x)^2}$.

(16) $y = (\cos x)^{\sin x} = e^{\sin x \ln(\cos x)} \Rightarrow y' = e^{\sin x \ln(\cos x)}\left[\sin x \frac{(-\sin x)}{\cos x} + \cos x \ln(\cos x)\right]$

(18) $y' = \frac{1}{3}\left[1+\cos^2 x + \tan^2 x\right]^{-2/3}\cdot\left[-2(\cos x)(\sin x) + 2\tan x \sec^2 x\right]$.

(19) $y' = \dfrac{(\tan x + \sec x)(\cos x - \sin x) - (\sin x + \cos x)(\sec^2 x + \sec x \tan x)}{(\tan x + \sec x)^2}$.

(20) $y' = \dfrac{-2(\csc\sqrt{x})(\csc\sqrt{x})(\cot\sqrt{x})\cdot\frac{1}{2\sqrt{x}}}{\csc^2(\sqrt{x})}$.

(17) $y' = -\dfrac{1+y^3-2x\cos(y-1)}{3xy^2+x^2\sin(y-1)}$.

(21) $y' = 3x(\sinh^2 x)(\cosh x) + \sinh^3 x + 4\,\mathrm{sech}^2(4x)$.