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DATEIFORMAT P-D-F

Die folgenden Aufgaben gebe ich frei: A18, A19

(18-1)/20 * 30=25.5

A18 a) $2x + 1 + \frac{1}{2}x^{-0,5} + -\frac{1}{2}x^{-1,5} + -1x^{-2} + -2x^{-3}$ ✓

b) $4(x^2 + \sqrt{2x})^3 \cdot (2x + (2x)^{-0,5})$ ✓+

c) $2xe^{x^2}(\ln(3x+2)) + e^{x^2}\ln(3x+2) + xe^{x^2}\frac{3}{3x+2}$ ✓

d) $-\frac{1}{\sqrt{1-x}} \cdot \frac{1}{2}x^{-0,5} = -\frac{1}{2\sqrt{1-x}\cdot\sqrt{x}}$ ✓

e) $\frac{2\cos(2x)\cdot\ln(x^2+1) - \frac{2x\sin(2x)}{x^2+1}}{\ln^2(x^2+1)}$ ✓+

f) ~~$e^{x\ln a}\ln a$~~ e^(ln(x)a)

g) ~~$e^{x\ln x - x^2}$~~ $(\ln(x^2) + x\cdot\frac{1}{x^2}\cdot(-2x))$ (2)

h) $\frac{1}{x\ln(2\ln x)}\cdot\left(1 + \frac{1}{2\ln x}\cdot\frac{2}{x}\right)$ ✓

A19 a) $\lim_{h\to 0}\frac{(\cos(x)\cdot\cos(h) - \sin(x)\cdot\sin(h)) - \cos(x)}{h} = \lim_{h\to 0}\frac{\cos(x)(\cos(h)-1) - \sin(h)\sin(x)}{h} =$ ✓

$= \cos(x)\underbrace{\lim_{h\to 0}\frac{\cos(h)-1}{h}}_{0} - \sin(x)\underbrace{\lim_{h\to 0}\frac{\sin(h)}{h}}_{1} = -\sin(x)$ ✓

b) $\left(\frac{\sin(x)}{\cos(x)}\right)' \quad \frac{(\cos(x))^2 - \sin(x)(-\sin(x))}{(\cos(x))^2}$ ✓

$\begin{cases} \frac{1}{\cos^2(x)}, \text{ da } \cos^2(x)+\sin^2(x)=1 \text{ i)} \\ \frac{\cos^2(x)}{\cos^2(x)} + \frac{\sin^2(x)}{\cos^2(x)} = 1 + \tan^2(x) \text{ ii)} \end{cases}$ ✓

c) $y = \tan(x)$ $\arctan(y)' = \frac{1}{\tan^2(x)+1}$ aufschreiben

$\arctan(y)' = \frac{1}{y^2+1}$ ✓ $\Rightarrow \arctan(x)' = \frac{1}{x^2+1}$ i) ✓

$\tan''(x) = 2\tan(x)\cdot(1+\tan^2(x)) = 2\tan(x) + 2\tan^3(x)$ ✓+

$\tan'''(x) = 2 + \underbrace{2\tan^2(x) + 6\tan^2(x)}_{8\tan^2(x)} + 6\tan^4(x)$ ✓ ✓