Settimana: 9

Materia: Matematica
Classe: 5A
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183 $f(x) = 2\sqrt{x} - \frac{1}{x} = 2x^{1/2} - x^{-1}$

$f'(x) = \cancel{2}\,\frac{1}{\cancel{2}}\,x^{\frac{1}{2}-1} - (-1)\,x^{-1-1}$

$= x^{-1/2} + x^{-2}$

184 $f(x) = \frac{1}{4}x^8 - \frac{2}{\sqrt{x}} + \frac{1}{x^3} = \frac{1}{4}x^8 - 2x^{-1/2} + x^{-3}$

$f'(x) = \frac{1}{4}\,8\cdot x^7 - 2\left(-\frac{1}{2}\right)x^{-\frac{1}{2}-1} + (-3)\,x^{-3-1}$

$= 2x^7 + x^{-\frac{3}{2}} - 3x^{-4}$

189 $f(x) = \sqrt{\sqrt{x}} - \ln\left(\frac{1}{x^2}\right) + e^4$

$= (x^{1/2})^{1/2} - \ln(x^{-2}) + e^4$

$= x^{\frac{1}{4}} + 2\ln(x) + e^4$

$f'(x) = \frac{1}{4}\,x^{\frac{1}{4}-1} + 2\cdot\frac{1}{x} + 0$

$= \frac{1}{4}\,x^{-\frac{3}{4}} + \frac{2}{x}$

197 $f(x) = 5e^x \cdot \sin x$

$(fg)' = f'g + fg'$

$$f'(x) = 5[e^x \cdot \sin x + e^x \cdot \cos x]$$
$$= 5e^x(\sin x + \cos x)$$

<u>200</u>: $f(x) = 3x \cdot \ln x$

$$f'(x) = 3\left[1 \cdot \ln(x) + \cancel{x} \cdot \frac{1}{\cancel{x}}\right] = 3(\ln x + 1)$$

<u>218</u> $f(x) = \underbrace{x \cdot \sin x}\cdot\underbrace{\cos x}$

$$f'(x) = [(x\sin x)' \cdot \cos x + x\sin x(\cos x)']$$
$$= [(1 \cdot \sin x + x\cos x) \cdot \cos x + x\sin x(-\sin x)]$$
$$= \sin x\cos x + x\cos^2 x - x\sin^2 x$$

<u>242</u>: $f(x) = \dfrac{1-\ln x}{1+\ln x}$ $\left(\dfrac{f}{g}\right)' = \dfrac{f'g - fg'}{g^2}$

$$f'(x) = \frac{(1-\ln x)' \cdot (1+\ln x) - (1-\ln x)(1+\ln x)'}{(1+\ln x)^2}$$

$$= \frac{-\frac{1}{x}(1+\ln x) - (1-\ln x)\frac{1}{x}}{(1+\ln x)^2} =$$

$$= \frac{-1 - \cancel{\ln} x - 1 + \cancel{\ln} x}{x(1+\ln x)^2} = -\frac{2}{x(1+\ln(x))^2}$$

<u>250</u>: $f(x) = \dfrac{x^2}{\underset{2(x+3)}{6+2x}} - \dfrac{x^2-1}{x+3} = \dfrac{x^2-2x^2+2}{2(x+3)} = \dfrac{-x^2+2}{2(x+3)}$

$$f'(x) = \frac{(-x^2+2)'\,2(x+3) - (-x^2+2)[2(x+3)]'}{[2(x+3)]^2}$$

$$= \frac{-2x \cdot 2 \cdot (x+3) - (-x^2+2)(2)}{[2(x+3)]^2}$$

$$= \frac{-4x^2 - 12x + 2x^2 - 4}{4(x+3)^2} = \frac{-2x^2 - 12x - 4}{4(x+3)^2} = \frac{-x^2 - 6x - 2}{2(x+3)^2}$$

Derivata della funzione composta: (Tutto nei domini giusti)

$$(f \circ g)(x) = f(g(x))$$

$$[f(g(x))]' = f'(g(x)) \cdot g'(x)$$

272: $h(x) = e^{4x}$

$f(x) = e^x$, $g(x) = 4x$

$f(g(x)) = f(4x) = e^{4x}$

$f'(x) = e^x$ $\qquad g'(x) = 4$

$$h'(x) = e^{4x} \cdot 4 = 4e^{4x}$$

273 $f(x) = \ln(2x^2 - x)$

$$f'(x) = \boxed{\frac{1}{2x^2 - x}} \cdot (4x - 1)$$

derivata di quello che c'è dentro

la derivata di ln valutata in quello che c'è dentro

283: $f(x) = \sin 5x$ $\qquad f'(x) = \cos(5x) \cdot 5$