

ES. PAG 53 N 120

$$D \left((2^x + \log_2 x)^2 \right) = ?$$

$$f(x) = 2^x + \log_2 x$$

$$D \left((2^x + \log_2 x)^2 \right) = D \left((f(x))^2 \right) =$$

$$= 2 f(x) \cdot f'(x) = (\bullet)$$

$$f'(x) = 2^x \ln 2 + \frac{1}{x} \log_2 e = 2^x \ln 2 + \frac{1}{x \ln 2}$$

$$\log_2 e = \frac{\ln e}{\ln 2} = \frac{1}{\ln 2}$$

$$(\bullet) = 2 \left(2^x + \log_2 x \right) \left(2^x \ln 2 + \frac{1}{x \ln 2} \right)$$

ES N. 108

$$D \left(\frac{1}{2} \ln^2 x - \ln x + \sqrt{x} \right) =$$

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

$$= \frac{1}{x} \ln x - \frac{1}{x} + \frac{1}{2\sqrt{x}}$$

N 132

$$D \left(\frac{x^2+1}{5x-7} \right) = \frac{2x(5x-7) - (x^2+1)5}{(5x-7)^2} =$$

$$= \frac{10x^2 - 14x - 5x^2 - 5}{(5x-7)^2} = \frac{5x^2 - 14x - 5}{(5x-7)^2}$$

N 225

$$D \left(\cos^2(5x-1) \right) = D \left(f^2(x) \right) = 2f(x)f'(x)$$

$$f(x) = \cos(5x-1)$$

$$f'(x) = -\sin(5x-1) \cdot 5 = -5 \sin(5x-1)$$

$$(\bullet) = 2 \cos(5x-1) (-\sin(5x-1)) (5) = \begin{matrix} 2 \sin x \cos x = \\ = \sin 2x \end{matrix}$$

$$= -10 \sin(5x-1) \cos(5x-1) = -5 \cdot 2 \sin(5x-1) \cos(5x-1)$$

$$= -5 \sin 2(5x-1)$$

N 105

$$D \left(\operatorname{tg}^4 x \right) = D \left(\left(\frac{\cos x}{\operatorname{sen} x} \right)^4 \right) = (0)$$

$$f(x) = \frac{\cos x}{\operatorname{sen} x}$$

$$f'(x) = \frac{-\operatorname{sen}^2 x - \cos^2 x}{\operatorname{sen}^2 x} =$$

$$= \frac{-1}{\operatorname{sen}^2 x}$$

$$(0) = D \left((f(x))^4 \right) =$$

$$= 4 (f(x))^3 f'(x) =$$

$$= 4 \left(\frac{\cos x}{\operatorname{sen} x} \right)^3 \left(-\frac{1}{\operatorname{sen}^2 x} \right) = -4 \frac{\operatorname{tg}^3 x}{\operatorname{sen}^2 x}$$

$$\frac{1}{\operatorname{sen}^2 x} = \frac{\operatorname{sen}^2 x + \cos^2 x}{\operatorname{sen}^2 x} = 1 + \operatorname{ctg}^2 x$$