

Matematika 3 vježbe

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1 Vježbe 1

1.1 i) $f(x) = x^5 \cdot \sqrt[3]{x^4}$

Solution.1

$$f'(x) = 5x^4 \cdot x^{\frac{4}{3}} + x^5 \cdot \frac{4}{3}x^{\frac{1}{3}}$$

$$f'(x) = 5x^{\frac{16}{3}} + \frac{4}{3}x^{\frac{16}{3}}$$

$$f'(x) = \frac{19}{3}x^{\frac{16}{3}}$$

Solution.2

$$f'(x) = (x^{\frac{19}{3}})'$$

$$f'(x) = \frac{19}{3}x^{\frac{19}{3}-1}$$

$$f'(x) = \frac{19}{3}x^{\frac{16}{3}}$$

1.2 l) $f(x) = \frac{6\cos x}{11\sin x + x}$

$$f'(x) = \frac{-6\sin x \cdot (11\sin x + x) - 6\cos x \cdot (11\cos x + 1)}{(11\sin x + x)^2}$$

$$f'(x) = \frac{-66\sin^2 x - 6\sin^2 x - 66\cos^2 x - 6\cos x}{(11\sin x + x)^2}$$

$$f'(x) = \frac{-6(11\sin^2 x + 11\cos^2 x + x\sin x + \cos x)}{(11\sin x + x)^2}$$

Pythagorean.identity : $\cos^2(x) + \sin^2(x) = 1$
 $-66(\cos^2 x + \sin^2 x) = -66(1) = -66$

$$f'(x) = \frac{-6(x\sin x + \cos x + 11)}{(11\sin x + x)^2}$$

$$\mathbf{1.3} \quad \mathbf{o)} \quad f(x) = \frac{x}{e^x}$$

$$f'(x) = \frac{(x)' \cdot e^x - x \cdot (e^x)'}{(e^x)^2}$$

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

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

$$f'(x) = \frac{1-x}{e^x}$$

2 Vježbe 2