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) $f(x) = \frac{6cosx}{11sinx+x}$

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

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

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

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

$f'(x) = \frac{-6(xsinx+cosx+11)}{(11sinx+x)^2}$

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

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

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

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

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