Anwendung der Kettenregel bei Ganzrationalen Funktionen

a) $f(x) = (2x + 1)^3$

b) $f(x) = (4x^2 + 3x + 1)^2$

c) $f(x) = (x^4 - 2x^2 + 1)^3$

d) $f(x) = \left(\frac{1}{2}x^3 + 2x^2 - x\right)^2$

e) $f(x) = (3x + 2)^2$

f) $f(x) = (x^2 + 1)^5$

g) $f(x) = (-3x^4 + 5x^3 - x^2 + 2x)^2$

h) $f(x) = (4x^3 - 2x)^2$

i) $f(x) = \left(\frac{1}{4}x^4 + \frac{1}{2}x^2 - 2x\right)^3$

j) $f(x) = (2x - 1)^3 + 3x^2$

Lösungen

a) $f(x) = (2x+1)^3 \qquad f'(x) = 6(2x+1)^2$

b) $f(x) = (4x^2+3x+1)^2 \qquad f'(x) = 2(4x^2+3x+1)(8x+3)$

c) $f(x) = (x^4-2x^2+1)^3 \qquad f'(x) = 3(x^4-2x^2+1)^2(4x^3-4x)$

d) $f(x) = \left(\frac{1}{2}x^3+2x^2-x\right)^2 \qquad f'(x) = 2\left(\frac{1}{2}x^3+2x^2-x\right)\left(3x^2+4x-1\right)$

e) $f(x) = (3x+2)^2 \qquad f'(x) = 2(3x+2)(3)$

f) $f(x) = (x^2+1)^5 \qquad f'(x) = 10(x^2+1)^4(2x)$

g) $f(x) = (-3x^4+5x^3-x^2+2x)^2 \qquad f'(x) = 2(-3x^4+5x^3-x^2+2x)(-12x^3+15x^2-2x+2)$

h) $f(x) = (4x^3-2x)^2 \qquad f'(x) = 2(4x^3-2x)(12x^2-2)$

i) $f(x) = \left(\frac{1}{4}x^4+\frac{1}{2}x^2-2x\right)^3 \qquad f'(x) = 3\left(\frac{1}{4}x^4+\frac{1}{2}x^2-2x\right)^2\left(x^3+x\right)$

j) $f(x) = (2x-1)^3+3x^2 \qquad f'(x) = 3(2x-1)^2(2)+6x$