Lösung A1

a) $f_1'(x) = -2 \cdot (3x+1) + 3 \cdot (1-2x)$
$= 1 - 12x$

b) $f_2'(x) = 2x \cdot (x^3+1) + 3x^2 \cdot (x^2-4)$
$= x(5x^3 - 12x + 2)$

c) $f_3'(x) = \frac{1}{2} \cdot (4 - 0{,}8x^2) - 1{,}6x \cdot (\frac{1}{2}x - 1)$
$= -1{,}2x^2 + 1{,}6x + 2$

d) $f_4'(t) = (6t+1) \cdot (1-t^2) - 2t \cdot (3t^2+t)$
$= -12t^3 - 3t^2 + 6t + 1$

e) $f_5'(x) = (3x^2+2x) \cdot (1-x) - (3x^2+2x)$
$= 2x - 4x^3$

f) $f_6'(r) = 2(1+r^2) \cdot 2r$
$= 4x(x^2+1)$

Lösung A2

a) $f_1'(x) = \sqrt{x} + \frac{x}{2\sqrt{x}} = \frac{3}{2} \cdot \sqrt{x}$

b) $f_2'(x) = 2x \cdot \sqrt{x} + \frac{x^2}{2\sqrt{x}} = \frac{5}{2} \cdot \sqrt{x^3}$

c) $f_3'(x) = 2 \cdot \sqrt{x} + \frac{(2x-1)}{2\sqrt{x}} = \frac{6x-1}{2\sqrt{x}}$

d) $f_4'(t) = 94t \cdot \sqrt{t} + \frac{47t^2-1}{2\sqrt{t}} = \frac{235t^2-1}{2\sqrt{t}}$

e) $f_5'(x) = -\frac{1}{x^2}(1-x^3) - \frac{3x^2}{x} = -\frac{2x^3+1}{x^2}$

f) $f_6'(x) = -\frac{3}{x^2}$

g) $f_7'(x) = cos(x) - x \cdot sin(x)$

h) $f_8'(x) = 2x \cdot sin(x) + (x^2+1) \cdot cos(x)$

i) $f_9'(x) = \frac{cos(x)}{2\sqrt{x}} - \sqrt{x} \cdot sin(x) = \frac{cos(x) - 2x \cdot sin(x)}{2\sqrt{x}}$

j) $f_{10}'(t) = cos^2(t) - sin^2(t)$

k) $f_{11}'(t) = 2sin(t) \cdot cos(t) = sin(2t)$

l) $f_{12}'(t) = -2sin(t) \cdot cos(t) = -sin(2t)$

Lösung A3

a) $f_1'(x) = m$

b) $f_2'(x) = 2ax$

c) $f_3'(t) = gt$

d) $f_4'(x) = t \cdot (2x-1)$

e) $f_5'(t) = x^2 - x$

f) $f_6'(z) = 0$

g) $f_7'(x) = g(x) + x \cdot g'(x)$

h) $f_8'(x) = 2g(x) \cdot g'(x)$

i) $f_9'(x) = g''(x) \cdot g(x) + \left(g'(x)\right)^2$