Lösung der Ableitungsübungen zu $f(x) = \sqrt{x}$, $f(x) = \frac{1}{x}$ und $f(x) = \sin(x)$

$f(x) = \frac{2}{x} = 2 \cdot x^{-1}$	$f'(x) = -\frac{2}{x^2}$
$f(x) = 3 \cdot \sqrt{x} = 3 \cdot x^{\frac{1}{2}}$	$f'(x) = \frac{3}{2 \cdot \sqrt{x}}$
$f(x) = \sqrt{4x+1}$	$f'(x) = \frac{2}{\sqrt{4x+1}}$
$f(x) = 6 - \frac{1}{2x} = 6 - \frac{1}{2} \cdot x^{-1}$	$f'(x) = \frac{1}{2x^2}$
$f(x) = \sqrt{x} \cdot e^x$	$f'(x) = \sqrt{x} \cdot e^x + \frac{1}{2\sqrt{x}} \cdot e^x$
$f(x) = \frac{1}{3x} \cdot \sqrt{x+1}$ $=(3x)^{-1} \cdot (x+1)^{\frac{1}{2}}$	$f'(x) = 3 \cdot (-1) \cdot (3x)^{-2} \cdot (x+1)^{\frac{1}{2}} + (3x)^{-1} \cdot \frac{1}{2} \cdot (x+1)^{-\frac{1}{2}}$ $= -\frac{1}{3x^2} \cdot (x+1)^{\frac{1}{2}} + \frac{1}{6x} \cdot (x+1)^{-\frac{1}{2}}$
$f(x) = \frac{2}{x-3} = 2 \cdot (x-3)^{-1}$	$f'(x) = -\frac{2}{(x-3)^2}$
$f(x) = \sqrt{3x+6} \cdot x^2$	$f'(x) = \frac{3}{2 \cdot \sqrt{3x+6}} \cdot x^2 + \sqrt{3x+6} \cdot 2x$
$f(x) = -\frac{3}{x} \cdot e^{2x}$	$f'(x) = \frac{3}{x^2} \cdot e^{2x} - \frac{3}{x} \cdot 2 \cdot e^{2x} = \frac{3}{x^2} \cdot e^{2x} - \frac{6}{x} \cdot e^{2x}$
$f(x) = (\frac{1}{x} + 2) \cdot \sin(x)$	$f'(x) = (\frac{1}{x} + 2) \cdot \cos(x) - \frac{1}{x^2} \cdot \sin(x)$
$f(x) = \cos(x) \cdot \sqrt{6x+10}$	$f'(x) = \cos(x) \cdot \frac{3}{\sqrt{6x+10}} - \sin(x) \cdot \sqrt{6x+10}$
$f(x) = (1 - \frac{4}{x}) \cdot e^x$	$f'(x) = (1 - \frac{4}{x}) \cdot e^x + \frac{4}{x^2} \cdot e^x = (1 - \frac{4}{x} + \frac{4}{x^2}) \cdot e^x$
$f(x) = (\frac{3}{x} - 6) \cdot \sqrt{3x+6}$	$f'(x) = (-\frac{3}{x^2}) \cdot \sqrt{3x+6} + (\frac{3}{x} - 6) \cdot \frac{3}{2 \cdot \sqrt{3x+6}}$
$f(x) = \cos(2x) \cdot \sqrt{x+2}$	$f'(x) = \cos(2x) \cdot \frac{1}{2 \cdot \sqrt{x+2}} - 2\sin(2x) \cdot \sqrt{x+2}$
$f(x) = (-\frac{2}{x} - 8) \cdot \sin(4x)$	$f'(x) = (-\frac{2}{x} - 8) \cdot 4 \cdot \cos(4x) + \frac{2}{x^2} \cdot \sin(4x)$