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Nr. 1) a) $g(x) = x^2 \cdot \sin(x) \Rightarrow g'(x) = 2x \cdot \sin(x) + x^2 \cdot \cos(x)$

b) $h(x) = \sqrt{x} \cdot (4x+1) \Rightarrow g'(x) = \frac{1}{2\sqrt{x}} \cdot (4x+1) + \sqrt{x} \cdot 4$

c) $k(x) = (2x-3) \cdot \cos(4x) \Rightarrow$ ~~$k'(x) = 2 \cdot \cos(4x) + (2x-3) \cdot$~~ V

$k'(x) = 2 \cdot \cos(4x) + (2x-3) \cdot (-\sin(4x)) \cdot 4$

$k'(x) = 2 \cdot \cos(4x) - (8x-12) \cdot \sin(4x)$

Nr. 2) a) $f(x) = x \cdot \sin(x) \Rightarrow f'(x) = 1 \cdot \sin(x) + x \cdot \cos(x)$

b) $f(x) = 3x \cdot \cos(x) \Rightarrow f'(x) = 3 \cdot \cos(x) + 3x \cdot (-\sin(x))$

$f'(x) = 3 \cdot \cos(x) - 3x \cdot \sin(x)$

c) $f(x) = (3x+2) \cdot \sqrt{x} \Rightarrow f'(x) = 3 \cdot \sqrt{x} + (3x+2) \cdot \frac{1}{2\sqrt{x}}$

d) $f(x) = (2x-3) \cdot \sqrt{x} \Rightarrow f'(x) = 2 \cdot \sqrt{x} + (2x-3) \cdot \frac{1}{2\sqrt{x}}$

e) $f(x) = \sqrt{x} \cdot \cos(x) \Rightarrow f'(x) = \frac{1}{2\sqrt{x}} \cdot \cos(x) + \sqrt{x} \cdot (-\sin(x))$

$F'(x) = \frac{1}{2\sqrt{x}} \cdot \cos(x) - \sqrt{x} \cdot \sin(x)$

f) $f(x) = (5-3x) \cdot \sin(x) \Rightarrow f'(x) = -3 \cdot \sin(x) + (5-3x) \cdot \cos(x)$

g) $f(x) = \frac{2}{x} \cdot \cos(x) = 2 \cdot x^{-1} \cdot \cos(x)$

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

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

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Nr. 2) h) $F(x) = \sin(x) \cdot \cos(x) \Rightarrow$ ~~$F'(x) = \cos(x)\cos(x)$~~ V

$F'(x) = \cos(x) \cdot \cos(x) + \sin(x) \cdot (-\sin(x))$

$F'(x) = (\cos(x))^2 - (\sin(x))^2$

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i) $F(x) = x^2 \cdot \sin(x) \Rightarrow F'(x) = 2x \cdot \sin(x) + x^2 \cdot \cos(x)$

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j) $F(x) = \frac{1}{\sqrt{x}} \cdot \cos(x) = x^{-\frac{1}{2}} \cdot \cos(x)$

$F'(x) = -\frac{1}{2} x^{-\frac{3}{2}} \cdot \cos(x) + x^{-\frac{1}{2}} \cdot (-\sin(x))$

$F'(x) = \frac{-1}{2 \cdot \sqrt[2]{x^3}} \cos(x) - \frac{1}{\sqrt{x}} \cdot \sin(x)$

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k) $F(x) = \frac{\pi}{4} \cdot \sin(x) \cdot (2-x)$

$F'(x) = \frac{\pi}{4} \cdot \cos(x) \cdot (2-x) + \frac{\pi}{4} \sin(x) \cdot (-1)$

$F'(x) = \frac{\pi}{4} \cdot \cos(x) \cdot (2-x) - \frac{\pi}{4} \sin(x)$

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l) $F(x) = \sqrt{3} \cdot \sqrt{x} = \sqrt{3} \cdot x^{\frac{1}{2}}$

$F'(x) = \sqrt{3} \cdot \frac{1}{2} \cdot x^{-\frac{1}{2}} = \frac{\sqrt{3}}{2\sqrt{x}}$

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