ABIAUFGABEN PFLICHTTEILE ABLEITEN

ABI 2014 $f(x) = \sqrt{x} \cdot e^{2x}$ [PR + KR]

$f'(x) = \frac{1}{2\sqrt{x}} \cdot e^{2x} + 2\sqrt{x} e^{2x} = e^{2x}\left(\frac{1}{2\sqrt{x}} + 2\sqrt{x}\right)$

ABI 2013 $f(x) = (2x^2 + 5)\, e^{-2x}$ [PR + KR]

$f'(x) = 4x\, e^{-2x} + (2x^2+5)(-2) \cdot e^{-2x} = e^{-2x} \cdot (-4x^2 + 4x - 10)$

ABI 2012 $f(x) = (\sin x + 7)^5$ [KR]

$f'(x) = 5(\sin x + 7)^4 \cdot \cos x = 5\cos x\, (\sin x + 7)^4$

ABI 2011 $f(x) = \frac{\sin(2x)}{x} = \sin(2x) \cdot x^{-1}$ [PR + KR]

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

ABI 2010 $f(x) = (2 - 3x)\, e^{-x}$

$f'(x) \overset{[PR+KR]}{=} -3\, e^{-x} + (2-3x)(-1) e^{-x} = -3e^{-x} - (2-3x)\, e^{-x} = -e^{-x}(-3 - 2 - 3x)$

$= -e^{-x}(-5 - 3x)$

$= e^{-x}(3x - 5)$

ABI 2009 $f(x) = x^2 \cdot \sin(3x+1)$ [PR + KR]

$f'(x) = 2x \cdot \sin(3x+1) + x^2 \cdot \cos(3x+1) \cdot 3 = 2x \sin(3x+1) + 3x^2 \cos(3x+1)$

ABI 2008 $f(x) = \frac{2x^2}{2x^2 - 3}$ [kann auch mit PR + KR abgeleitet werden: $f(x) = \underbrace{2x^2}_{u} \underbrace{(2x^2-3)^{-1}}_{v}$ ...]

$f'(x) \overset{[QR]}{=} \frac{4x \cdot (2x^2-3) - 2x^2 \cdot (4x)}{(2x^2-3)^2} = \frac{8x^3 - 12x - 8x^3}{(2x^2-3)^2}$

ABI 2007 $f(x) = (1 + \sin x)^2$ [$= 1 + 2\sin x + \sin^2 x$] ← binom. Formel

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

$= 2\cos x\,(1 + \sin x)$

ABI 2006 $f(x) = \frac{1}{9} \sin(4x^2)$

$f'(x) = \frac{1}{9} \cos(4x^2) \cdot 8x = \frac{8}{9} x \cdot \cos(4x^2)$

ABI 2005 $f(x) = x^3 \cdot e^{2x}$

$f'(x) = 3x^2 \cdot e^{2x} + x^3 \cdot 2 \cdot e^{2x} = x^2 e^{2x} \cdot (3 + 2x)$

ABI 2004 $f(x) = \frac{x^2}{x^2 + 3}$

$f'(x) = \frac{2x(x^2+3) - x^2(2x)}{(x^2+3)^2} = \frac{2x^3 + 6x - 2x^3}{(x^2+3)^2}$