

Nr. 5)  $f(x) = 3x \cdot \ln(x)$

a)  $f'(x) = 3 \cdot \ln(x) + 3x \cdot \frac{1}{x} = \underline{\underline{3 \cdot (\ln(x) + 1)}}$

b)  $f(x) = x^2 \cdot (\ln(x) - \frac{1}{2})$

$f'(x) = 2x \cdot (\ln(x) - \frac{1}{2}) + x^2 \cdot \frac{1}{x} = 2x \cdot \ln(x) - x + x = \underline{\underline{2x \cdot \ln(x)}}$

c)  $f(x) = \ln(2x)$

$f'(x) = \frac{1}{2x} \cdot 2 = \underline{\underline{\frac{1}{x}}}$

d)  $f(x) = \ln(4x) - x$

$f'(x) = \frac{1}{4x} \cdot 4 - 1 = \underline{\underline{\frac{1}{x} - 1}}$

e)  $f(x) = x \cdot \ln(5)$

$f'(x) = \underline{\underline{\ln(5)}}$

f)  $f(x) = (x-2) \cdot \ln(x^2-4)$

$f'(x) = 1 \cdot \ln(x^2-4) + (x-2) \cdot \frac{1}{x^2-4} \cdot 2x$

$f'(x) = \ln(x^2-4) + \frac{2x}{(x-2)(x+2)} = \underline{\underline{\ln(x^2-4) + \frac{2x}{x+2}}}$

Nr. 8) a)  $\ln(x^5) = \underline{\underline{5 \cdot \ln(x)}}$ ; b)  $\ln(\frac{1}{x^2}) = \ln(x^{-2}) = \underline{\underline{-2 \cdot \ln(x)}}$

c)  $\ln(x^3) + \ln(x^4) = 3 \cdot \ln(x) + 4 \ln(x) = \underline{\underline{7 \cdot \ln(x)}}$

d)  $\ln(\sqrt{x}) = \ln(x^{\frac{1}{2}}) = \underline{\underline{\frac{1}{2} \ln(x)}}$

e)  $\ln(x^5 \cdot x^3) - \ln(\frac{1}{x}) = \ln(x^8) - \ln(x^{-1}) = 8 \ln(x) + \ln(x) = \underline{\underline{9 \cdot \ln(x)}}$

f)  $\ln(\frac{1}{\sqrt{x}}) - \frac{1}{2} \ln(x^3) = \ln(x^{-\frac{1}{2}}) - \frac{3}{2} \cdot \ln(x) = -\frac{1}{2} \ln(x) - \frac{3}{2} \ln(x)$   
 $= -\frac{4}{2} \ln(x) = \underline{\underline{-2 \ln(x)}}$