

yhteisesti

$$D \ln x = \frac{1}{x}$$

$$D \ln f(x) = \frac{1}{f(x)} \cdot f'(x) = \frac{f'(x)}{f(x)}$$

$$D \log_a x = \frac{1}{x \ln a}$$

$$22. 2 \text{ a) } D \ln \frac{5}{x} = D(\underbrace{\ln 5}_{\text{vakio}} - \ln x) = 0 - \frac{1}{x} = -\frac{1}{x}$$

$$\text{b) } D \ln \frac{5}{2x} = D(\ln 5 - \ln 2x) = D(\ln 5 - (\ln 2 + \ln x)) = -\frac{1}{x}$$

$$\text{c) } D \ln x^3 = D(3 \ln x) = 3 \cdot \frac{1}{x} = \frac{3}{x}$$