DERIVATA DI $f(x)^{g(x)}$

$$y = f(x)^{g(x)} \qquad y = e^{\overbrace{g(x)\ln f(x)}^{F(x)}}$$

$$D\left(f(x)^{g(x)}\right) = D\left(e^{g(x)\ln f(x)}\right) = e^{g(x)\ln f(x)} \cdot D\left(g(x)\ln f(x)\right) =$$

$$= e^{g(x)\ln f(x)}\left[g'(x)\ln f(x) + g(x)\frac{1}{f(x)}f'(x)\right]$$

$$D\left(e^{f(x)}\right) = e^{f(x)} f'(x)$$

$$D\left(g(x)\ln f(x)\right) = g'(x)\ln f(x) + g(x)\frac{1}{f(x)}f'(x)$$

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