9. $f(x) = 3^x$

D $f'(x) = 3^x \ln 3$

$1 = 3^x \ln 3$

$\frac{1}{\ln 3} = 3^x$

$-.086 = x$

$\ln y = x \ln 3$

$\frac{1}{y}\frac{dy}{dx} = x \cdot \frac{1}{3} \cdot 0 +$

$\ln\left(\frac{1}{\ln 3}\right) = x \ln 3$

10. $7 = xy - e^{xy}$

D $0 = x \cdot \frac{dy}{dx} + y - \left[e^{xy} \cdot \left(x\frac{dy}{dx} + y\right)\right]$

$x\frac{dy}{dx} + y - \left[e^{xy}\left(x\frac{dy}{dx} + y\right)\right]$

$0 = x\frac{dy}{dx} + y - xe^{xy}\frac{dy}{dx} - ye^{xy}$

$-y + ye^{xy} = \frac{dy}{dx}\left(x - xe^{xy}\right)$

$\frac{-y + ye^{xy}}{x - xe^{xy}} = \frac{dy}{dx}$ $\quad \frac{-y(1 - e^{xy})}{x(1 - e^{xy})} = \frac{dy}{dx}$ $\quad \boxed{\frac{dy}{dx} = \frac{-y}{x}}$

C 11. $h(x) = f(x)e^{g(x)}$

$h'(x) = f(x) \cdot e^{g(x)} \cdot g'(x) + e^{g(x)} \cdot f'(x)$

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

B 12. $f(x) = \log_5 (x^2-1)^{1/2}$

$f'(x) = \frac{1}{(x^2-1)^{1/2}\ln 5} \cdot \frac{1}{2}(x^2-1)^{-1/2}(2x)$

↳ typo – should be $f'(x) = \frac{x}{(x^2-1)\ln 5}$

x in numerator!