Solutions to Quiz 12

MATH 139-01 and -02
Tuesday, October 14, 2003

Be sure to **show your work**. Unsupported answers receive no credit.

Compute the derivative of each function.

1. $f(x) = \dfrac{e^{2x}}{x^2}$

   Solution: $f'(x) = \dfrac{2e^{2x}x^2 - 2xe^{2x}}{x^4} = \dfrac{2x(x-1)e^{2x}}{x^4} = \dfrac{2(x-1)e^{2x}}{x^3}$.

2. $f(x) = (x^2+3)^4(3x^3-2x)^6$

   Solution: $f'(x) = [4(x^2+3)^3(2x)](3x^3-2x)^6 + [6(3x^3-2x)^5(27x^2-2)](x^2+3)^4$.

3. $f(t) = e^{-0.06t}$

   Solution: $f'(t) = -0.06e^{-0.06t}$.

4. $f(x) = \dfrac{1}{x^4}$

   Solution: $f(x) = x^{-4}$, so $f'(x) = -4x^{-5}$.

5. $f(x) = \dfrac{x}{\ln(x)}$

   Solution: $f'(x) = \dfrac{1 \cdot \ln(x) - \frac{1}{x} \cdot x}{(\ln(x)^2)} = \dfrac{\ln(x) - 1}{(\ln(x))^2}$.