

Ernesto Motor

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$$(58) f(x) = x e^{-x}$$

$$f'(x) = e^{-x} - x e^{-x} \\ = (1-x) e^{-x}$$

$$f''(x) = -e^{-x} + (1-x)(-e^{-x}) \\ = (x-2) e^{-x}$$

$$f'''(x) = (3-x) e^{-x}$$

$$f^{(4)}(x) = (x-4) e^{-x}$$

$$\boxed{f^{(1000)}(x) = (x-1000) e^{-x}}$$

$$h(x) = e^{-x}$$

$$\left. \begin{array}{l} f(u) = e^u \Rightarrow f'(u) = e^u \\ g(x) = -x \Rightarrow g'(x) = -1 \end{array} \right\} \begin{array}{l} h'(x) = -1 e^u \\ = -1 e^{-x} \end{array}$$