

Show work, be neat. Submit to the Canvas site by midnight tonight, one page PDF. Original work only. Beware, sites like wolfram, desmos, etc, show things in unique ways and we'll know if you used it.

Find these derivatives. Use techniques discussed in class thus far.

2pts a. $f(x) = x^2 e^{3x}$

$$f'(x) = 3x^2 e^{3x} + 2x e^{3x}$$

2pts b. $g(x) = \frac{5e^{-4x}}{x^2+1}$

$$g'(x) = \frac{(x^2 + 1)(-4e^{-4x}) - 5e^{-4x}(2x)}{(x^2 + 1)^2} = \frac{-2e^{-4x}(2x^2 + 5x + 2)}{(x^2 + 1)^2}$$

2pts c. $h(x) = (3x + 5)^4 \sin(2x - 6)$

$$\begin{aligned} h'(x) &= (3x + 5)^4 (2 \cos(2x - 6)) + 4(3x + 5)^3 \sin(2x - 6) \\ &= 2(3x + 5)^3 ((3x + 5) \cos(2x - 6) + 2 \sin(2x - 6)) \end{aligned}$$

2pts d. $k(x) = \frac{\cos(3x)}{\sin(4x)}$

$$k'(x) = \frac{-3 \sin(4x) \sin(3x) - 4 \cos(3x) \cos(4x)}{\sin^2(4x)}$$

2pts e. $m(x) = e^{\sin(5x)}$

$$m'(x) = 5 \cos(5x) e^{\sin(5x)}$$