

Name (1 point): *Ans Key*

#1. (24 points) Differentiate any THREE of the following functions. Make sure to clearly indicate which functions you are differentiating.

$$\begin{aligned}f(x) &= 6 + \frac{1}{x^2} + 2 \ln x + 5x \\p(s) &= 4s^7 + \sqrt{s} + 13^s + \ln 2 \\g(t) &= (\ln t)(t^2 + 3t) \\h(u) &= \frac{\sqrt{u}}{e^u} \\k(r) &= (\ln r)^3\end{aligned}$$

BONUS (8 points) Differentiate another function from the list above that you have not already differentiated.

$$f'(x) = 0 + (-2x^{-3}) + \frac{2}{x} + 5$$

$$p'(s) = 28s^6 + \frac{1}{2\sqrt{s}} + \ln(13)13^s + 0$$

$$g'(t) = \left(\frac{1}{t}\right)(t^2 + 3t) + (\ln t)(2t + 3)$$

$$h'(u) = \frac{\left(\frac{1}{2\sqrt{u}}\right)e^u - (\sqrt{u})(e^u)}{(e^u)^2}$$

$$k'(r) = 3(\ln r)^2 \cdot \left(\frac{1}{r}\right)$$