Show all work, clearly and legibly, to receive full credit. Correct spelling, organization of your solution, and proper use of mathematical notation all count. You may use a calculator, but no notes, books, or other resources. Good luck!

1.) (4 pts.) Let $f(x) = e^{-x}$. Zoom in numerically to estimate $f'(1.5)$.

Select two $x$-values close to 1.5. (If you want, you can use 1.5 as one of those $x$-values.)

For example:

$x = 1.5 : \quad e^{-x} = e^{-1.5} \approx 0.223$

$x = 1.51 : \quad e^{-x} = e^{-1.51} \approx 0.221$

\[
\frac{\Delta y}{\Delta x} = \frac{0.221 - 0.223}{1.51 - 1.5} = \frac{-0.002}{0.01} = -0.2 \approx f'(1.5)
\]

2.) (4 pts.) What does the difference quotient $\frac{f(a + h) - f(a)}{h}$ represent graphically?

The slope of the secant line through the points $(a, f(a))$ and $(a+h, f(a+h))$

3.) (2 pts.) Simplify using order of operations: $[2(1+3) + 1] \times 7 + 1$.

\[
= [2(4) + 1] \times 7 + 1 = 9 \times 7 + 1 = 63 + 1 = 64
\]