

5. [10 points] Give an argument verifying that $e^x \geq x + 1$ for all $x \geq 0$.

$$\text{let } f(x) = e^x$$

note $f'' = e^x > 0 \Rightarrow f$ is concave up
everywhere

$\Rightarrow f$ is always above its tangent lines

also $y = x + 1$ is the eqn of the
tangent line to f at $x = 0$

$\Rightarrow e^x \geq x + 1$ for all x .