2) h) $a_n = \frac{n}{e^n}$

i) $\lim_{x \to \infty} \frac{x}{e^x} \overset{LH}{=} \lim_{x \to \infty} \frac{1}{e^x} = \lim_{x \to \infty} e^{-x} \to$ Converge para 0.

Logo,

$$\lim_{x \to \infty} \frac{x}{e^x} = 0 = L$$

iii) $\varepsilon = 10^{-3} = 0,001$

Determinar $N(\varepsilon)$

$$|a_n - L| \leq \varepsilon, \quad \forall n \geq N(\varepsilon)$$

Ou seja,

$$\left|\frac{n}{e^n} - 0\right| \leq 0,001$$

$$\left|\frac{n}{e^n}\right| \leq 0,001$$

$$\frac{n}{e^n} \leq 0,001.$$

$$\frac{\ln(n)}{\ln(e^n)} \leq \ln(0,001)$$

$$\frac{1}{n} \leq \frac{\ln(0,001)}{\ln(n)}$$

$$-n \leq 0$$

$$\underline{\underline{n \geq 0}}$$

O valor mínimo para $N(\varepsilon)$ é 0.