3.2 $\dfrac{e^x - 1}{x} = \dfrac{1 + x + \frac{x^2}{2} + \frac{x^3}{6} + \ldots, -1}{x} =$

$$= 1 + \frac{x}{2} + \frac{x^2}{6} + \ldots + \frac{x^n}{n!}$$

$$R_T = \left| 1 + \frac{x}{2} + \underbrace{\frac{x^2}{6} + \ldots + \frac{x^2}{n!} }_{0} - 1 \right| \approx \frac{x}{2}$$

3.3. $f(x) = \dfrac{e^x - 1}{x} = \dfrac{a - 1}{x} = \dfrac{b}{x} = c$

$$\left| \frac{\Delta a}{a} \right|, \left| \frac{\Delta b}{b} \right|, \left| \frac{\Delta c}{c} \right| \leq \mu$$

$$|\Delta f| \lesssim \left| \frac{\partial f}{\partial a} \right| |\Delta a| + \left| \frac{\partial f}{\partial b} \right| + \left| \frac{\partial f}{\partial c} \right| |\Delta c| =$$

$$= \left| \frac{1}{x} \right| |\Delta a| + \left| \frac{1}{x} \right| |\Delta b| + |1| |\Delta c| \leq$$

$$\leq \left| \frac{a}{x} \right| \left| \frac{\Delta a}{a} \right| + \left| \frac{b}{x} \right| \left| \frac{\Delta b}{b} \right| + |c| \left| \frac{\Delta c}{c} \right| \leq$$

$$\leq \mu \left(\left| \frac{a}{x} \right| + \left| \frac{b}{x} \right| + |c| \right) =$$

$$= \mu \left(\left| \underset{\to 1, x \to 0}{\frac{e^x}{x}} \right| + \left| \underset{\to 1, x \to 0}{\frac{e^x - 1}{x}} \right| + \left| \underset{\to 1, x \to 0}{\frac{e^x - 1}{x}} \right| \right) =$$

$$= \mu \left(\left| \frac{1}{x} \right| + 2 \right) \approx \frac{\mu}{|x|} \ (R_x)$$

$$3.5 \ f(x) = \frac{e^x - 1}{\ln e^x} = \frac{a-1}{\ln a} = \frac{b}{\ln a} = \frac{b}{c} = d$$

$$\left| \frac{\Delta a}{a} \right|, \left| \frac{\Delta b}{b} \right|, \left| \frac{\Delta c}{c} \right|, \left| \frac{\Delta d}{d} \right| \qquad \leq \mu$$

$$|\Delta f| \underset{\approx}{\leq} \left| \frac{\partial f}{\partial a} \right| |\Delta a| + \left| \frac{\partial f}{\partial b} \right| |\Delta b| + \left| \frac{\partial f}{\partial c} \right| |\Delta c| + \left| \frac{\partial f}{\partial d} \right| |\Delta d| = \quad /\!/ \text{ tar länger} \text{ och derivera} /\!/$$

$$\left| a \frac{\ln a - \frac{(a-1)}{a}}{(\ln a)^2} \right| \left| \frac{\Delta a}{a} \right| + \left| \frac{b}{\ln a} \right| \left| \frac{\Delta b}{b} \right| + \left| \frac{b}{c} \right| \left| \frac{\Delta c}{c} \right| + |d| \left| \frac{\Delta d}{d} \right| \leq$$

$$\leq \mu \left(\left| a \frac{\ln a - \frac{(a-1)}{a}}{(\ln a)^2} \right| + \left| \frac{b}{\ln a} \right| + \left| \frac{b}{c} \right| + |d| \right)$$

$$= /\!/ \begin{array}{l} a = e^x \to 1, x \to 0 \\ \ln a = x \end{array} \quad \frac{e^x - 1}{x} \to 1, x \to 0 /\!/ =$$

$$= \mu \left(|e^x| \left| \frac{x - (e^x - 1)e^{-x}}{x^2} \right| + |1| + |1| + |1| \right) =$$

$$= \mu \left(1 \left| \frac{x + e^{-x} - 1}{x^2} \right| + 3 \right) =$$

$$= \mu \left(\left| \frac{\cancel{x} + \cancel{1} - \cancel{x} + \frac{x^2}{2} \dots - \cancel{1}}{x^2} \right| + 3 \right) =$$

$$\mu \left(\left| \frac{\frac{x^2}{2} + \frac{x^3}{6} + \dots}{x^2} \right| + 3 \right)$$

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$$= \mu \left(\left| \frac{1}{2} + \frac{x}{6} + \right| \cdots + 3 \right)$$

$$\approx \mu \left| \frac{1}{2} \right| = \left| \frac{\mu}{2} \right| \quad (R_t)$$