

$$a) \int_0^1 e^{3x} dx$$

$$f(x) = e^{3x} \quad f'(x) = 3e^{3x} \quad f''(x) = 9e^{3x}$$

The absolute error is  $\left| \frac{h^2}{2} (b-a) f''(\xi) \right|$ ,  $h = \frac{b-a}{n}$

$$\text{so } \left| \frac{h^2}{2} (b-a) f''(\xi) \right| = \frac{1}{12n^2} |f''(\xi)| \leq \frac{9e^3}{12n^2}$$

$$\text{so } \frac{9e^3}{12n^2} \leq 10^{-8} \quad \text{solve for } n \Rightarrow \begin{cases} n_1 = -38812.57 \\ n_2 = 38812.57 \end{cases}$$

$$\text{so } n \geq 38812.57$$

see matlab