1.

$$\text{cond} = \frac{xf'(x)}{f(x)} = \frac{xe^x}{e^x} = x$$

2. When

$$\text{cond} = x = 10^8$$

then

$$f(x) = e^x = e^{10^8} \approx 1.55 \times 10^{43429448}$$