Find absolute max ∧ absolute minimum values of $f(x) = \frac{e^x}{x^2+2x}$ on $(0,\infty)$, if they exist.

$$f'(x) = \frac{e^x(x^2+2x) - e^x(2x+2)}{(x^2+2x)^2}$$

$$= \frac{e^x(x^2-2)}{(x^2+2x)^2} = 0 \quad \Rightarrow \quad x = \mp\sqrt{2}$$

$x \neq 0, \; x \neq -2$

Since we have the interval $(0,\infty)$, the only critical pt is $x=\sqrt{2}$

Also, ∄ no singular pt since $x=0, x=-2 \notin \text{Dom}(f)$.

	$x=0$		$x=\sqrt{2}$	
f'	∄	−	0	+
f	∄	↘		↗

f on $(0,\infty)$

$(\sqrt{2}, f(\sqrt{2})) \rightarrow$ abs min pt, ie,

$f(\sqrt{2}) = \frac{e^{\sqrt{2}}}{2+2\sqrt{2}}$ is absolute min value.

∄ no abs maximum value since we have an open interval (there cannot be abs max/min at end pts) and the only critical pt is $x=\sqrt{2}$. (∄ no singular pt).

OR

$\lim_{x\to 0^+} f(x) = \infty = \lim_{x\to\infty} f(x) \Rightarrow$ ∄ no abs max value of f on $(0,\infty)$