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$z = \sin x \cosh y$

Critical points at $\frac{\partial z}{\partial x} = 0$ $\frac{\partial z}{\partial y} = 0$

$\frac{\partial z}{\partial x} = \cos x \cosh y = 0 \Rightarrow x = (n+\frac{1}{2})\pi$

$\frac{\partial z}{\partial y} = \sin x \sinh y = 0 \Rightarrow y = 0$

Critical points at $((n+\frac{1}{2})\pi, 0)$

$\frac{\partial^2 z}{\partial x^2} = -\sin x \cosh y$ $\frac{\partial^2 z}{\partial x \partial y} = \cos x \sinh y$

$\frac{\partial^2 z}{\partial y^2} = \sin x \cosh y$

$$\left(\frac{\partial^2 z}{\partial x \partial y}\right)^2 - \frac{\partial^2 z}{\partial x^2}\frac{\partial^2 z}{\partial y^2}$$

$D = (\cos x \sinh y)^2 - (-\sin x \cosh y)(\sin x \cosh y)$

$= \cos^2 x \sinh^2 y + \sin^2 x \cosh^2 y$

$x = (n+\frac{1}{2})\pi, y = 0$

$D = 0 + 1 = 1 > 0$

All the critical points are saddle points