

Applications of Partial Differentiation
Extremes

Question

Find and classify the critical points of the function

$$f(x, y) = x \sin y$$

Answer

For critical points we have:

$$f_1 = \sin y = 0 \quad f_2 = x \cos y = 0.$$

Since $\sin y$ and $\cos y$ cannot vanish at the same point, the only critical points correspond to $x = 0$ and $\sin y = 0$.

They are $(0, n\pi)$, for all integers n . All are saddle points.