Maximum and Minimum Values

Question

For the functions $f(x, y) = x^2y^2$ and $g(x, y) = x^3y^3$ we get $D_f = -12x^2y^2$ and $D_g = -45x^4y^4$ which both equal zero at $(0, 0)$. What is true about f and g?

A. Both f and g have a local minimum at $(0, 0)$.

B. f has a local minimum at $(0, 0)$ and g has a local maximum at $(0, 0)$.

C. f has a local minimum at $(0, 0)$, g has a saddle point at $(0, 0)$.

D. Both f and g have saddle points at $(0, 0)$.