The Fundamental Theorem

Question

Which of these is the general potential function of

$$\vec{F} = (2xy - 2)\vec{i} + (x^2 + 3y^2)\vec{j}$$

on the plane?

A. $f(x,y) = x^2y - 2x + C$

B. $f(x,y) = x^2y + y^3 + C$

C. $f(x,y) = x^2y + y^3 - 2x + C$

D. None of these. $\vec{F}$ is not conservative.