

Calc 2: Assignment 26

① Recall that if $\vec{F} = \langle M, N \rangle$ is conservative, then $\frac{\partial M}{\partial x} = \frac{\partial N}{\partial y}$. Which vector fields are conservative:

a) $\vec{F} = \langle 2x - 3y, -3x + 4y - 9 \rangle$

b) $\vec{F} = \langle e^x \cos(y), e^x \sin(y) \rangle$

c) $\vec{F} = \langle 3x^2 + 2y^2, 4xy + 3 \rangle$

② For the vector fields in ① that are conservative, find the potential function

③ Which of these vector fields is conservative:

a) $\vec{F} = \langle y^2 z^3, 2xy z^3, 3xy^2 z^2 \rangle$

b) $\vec{F} = \langle e^z, 1, xe^z \rangle$

c) $\vec{F} = \langle y \cos(xy), x \cos(xy), -\sin(z) \rangle$

④ For the vector fields in ③ that are conservative, find the potential function