Worksheet: Computing potentials

1.   Is the 2D vector field $\mathbf{F} = \langle \sin y, x \cos y \rangle$ conservative? If it is, compute a potential $f(x, y)$ so that $\mathbf{F} = \nabla f$.

2.   Is the 3D vector field $\mathbf{F} = \langle 2x, e^z, ye^z - 1 \rangle$ conservative? If it is, compute a potential $f(x, y, z)$ so that $\mathbf{F} = \nabla f$.

3.   Is the 3D vector field $\mathbf{F} = \langle y \sin(x), e^z, y \rangle$ conservative? If it is, compute a potential $f(x, y, z)$ so that $\mathbf{F} = \nabla f$.

4. Is the 2D vector field $\mathbf{F} = (2xye^{x^2y})\mathbf{i} + (x^2e^{x^2y})\mathbf{j}$ conservative? If it is, compute a potential $f(x,y)$ so that $\mathbf{F} = \nabla f$.

5. Is the 3D vector field $\mathbf{F} = (2xy)\mathbf{i} + (x^2 + 2yz)\mathbf{j} + y^2\mathbf{k}$ conservative? If it is, compute a potential $f(x,y,z)$ so that $\mathbf{F} = \nabla f$.

EXTRA SPACE