

HW 9
Math 261, F17

Please see the course syllabus for details on how to turn in your homework assignments. This one is due at the beginning of your class on **Friday, November 17**.

1. Suppose conservative vector field \mathbf{G} has potential function $g(x, y, z) = x^2 + yz$. Compute the work done when moving through this vector field along any closed, simple curve from from $(0, 1, 1)$ to $(2, 0, 1)$.
2. Find *the* potential function $f(x, y, z)$ for vector field

$$\mathbf{F} = \langle \sin(y), x \cos(y) + z \cos(y), \sin(y) + 2z \rangle$$

such that $f(9, 0, 1) = 2$. You may assume that \mathbf{F} is conservative.

3. Use the component test ($M_y = N_x$, etc.) to show that the vector field

$$\mathbf{H} = \langle ze^{xz} - \sin(x + 2y), \frac{1}{y} - 2 \sin(x + 2y) + 1, xe^{xz} + \frac{1}{z} \rangle$$

is conservative. (Your solution should consist of three equalities.)