

**HW 9**  
**Math 261, F18**

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 16**.

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 simple curve 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.)