

Submitting HW Tips**HW #7**

- 1** Given the system of equations $\begin{cases} x + 2z + u^2 + e^{2y} = 7 \\ x^2 - uz + y^3 = 2 \end{cases}$, is it possible to solve for $u = u(x, z)$ and $y = y(x, z)$ as functions of x and z in a neighborhood of $(x_0, y_0, z_0, u_0) = (0, 0, 1, -2)$?
- 2** Section 4.1 (Page 227): #20, 23.
- 3** Find the length of these curves:
- (a) $\mathbf{c}(t) = \left(2t, t^2, \frac{1}{3}t^3\right), 0 \leq t \leq 1.$
- (b) $y = \frac{1}{3}x^{\frac{3}{2}}$ from $(0, 0)$ to $(9, 9).$
- 4** Section 4.3 (Page 243): # 9, 16, 21(a).
- 5** If $\mathbf{F}(x, y) = \left(\{1 + 2x \ln y\}, \left\{ \frac{x^2}{y} + 2y \right\} \right) = \nabla \phi(x, y)$, find the unique **potential function** $\phi(x, y)$ which satisfies $\phi(-1, 1) = 4$.