MATH 10A (B. Engheta) – Quiz #12 – February 22, 2006

Notation Review. Consider a function $F : \mathbb{R}^4 \to \mathbb{R}^3$ with

$$F(x, y, z, w) = \big(f(x, y, z, w),\ g(x, y, z, w),\ h(x, y, z, w)\big),$$

$$f = x\, e^y + z\, \sin(w), \qquad \nabla g = \Big(x^z\, y^w,\ \frac{xy}{z + w},\ 42,\ xy - zw\Big),$$

$$h_{\mathbf{w}} = (x + z)^{y-w}, \qquad h_{\mathbf{z}} = \ln(x - y), \qquad h_{\mathbf{y}} = \ln(z + w), \qquad h_{\mathbf{x}} = e^{\pi}.$$

What is the Jacobian of F at $(3, 2, 1, 0)$?