Answers to Test 3, 1994

1. (a) $15/8$
   (b) $1/2$
   (c) 4
2. div $\overrightarrow{F} = 2y$
   curl $\overrightarrow{F} = \langle 0, 2(z-x), 0\rangle$
3. $(r, \theta, z) = (\sqrt{2}, \pi/4, \sqrt{6})$
   $(\rho, \phi, \theta) = (2\sqrt{2}, \pi/6, \pi/4)$ (note the order of the angles here)
4. $\frac{\pi}{2}\left(e^{16} - 1\right)$
5. $\int_0^{3\pi/4} \int_0^{2\pi} \int_0^{3} \rho^2 \sin\phi \, d\rho \, d\theta \, d\phi$
6. $2\pi(1 - \cos(3))$