Sample Exam. Good Luck!

1. A load impedance $Z_L = 35 + j75 \, \Omega$ to a transmission line with characteristic impedance $Z_o = 50 \, \Omega$. A short-circuit stub is placed directly at the load. The length of the stub at directly at the load is $0.176 \lambda$. What is the new admittance upon adding this stub?

2. Find the Standing Wave Ratio of the load $Z_L = 35 + j75 \, \Omega$ on a 50 \, \Omega line.

3. Find the Reflection Coefficient of the load $Z_L = 35 + j75 \, \Omega$ on a 50 \, \Omega line.

4. For the vector field $\vec{E} = \hat{x}2xy - \hat{y}(x^3 + 0.5y^2)$, and given the contour shown below:
   Calculate
   (a) $\oint \vec{E} \cdot d\vec{l}$
   (b) $\int_S (\nabla \times \vec{E}) \cdot d\vec{s}$

5. If $\vec{E} = \hat{x}E_o e^{-jkz}$ in a region,
   (a) Find the corresponding magnetic field.
   (b) Find $\vec{E}(t)$
   (c) Find $\vec{H}(t)$
   (d) Find the instantaneous power density (or Poynting vector).
   (e) Find the time-average Poynting vector.