M 5710 - Fall 2013
Quiz 1

Your name ....

1. Solve, using Lagrange multipliers method

$$\min_x x_1^2 + x_2^2 + x_3^3 - x_1 + x_2 + 3x_3 \text{ subject to } x_1 + 2x_2 = 1.$$

2. The network is shown in the figure:

Derive the formula for the current through the resistor R_5.

3. The triangular lattice was the first model used by Cauchy to derive equation of elasticity. Using the symmetry, the problem can be reduced to the two-rods network. Compute vertical u_V and horizontal u_H displacements caused by vertical force $F = (0, 1)$. What are the specific displacements ϵ

$$\epsilon_V = \frac{u_H}{\text{vertical distance}}; \quad \epsilon_H = \frac{u_H}{\text{horizontal distance}};$$

and the ratio between them?