



MAK506 THEORY OF ELASTICITY

SPRING 2009

Due date: March 12, 2009

HOMEWORK 4

1. (Pr. 4.2., Elasticity, M. H. Sadd) Substituting the general isotropic fourth-order form (4.2.6) into (4.2.3), explicitly develop the stress-strain relation (4.2.7).
2. (Pr. 4.3., Elasticity, M. H. Sadd) Following the steps outlined in the text, invert the form of Hooke's law given by (4.2.7) and develop form (4.2.10). Explicitly show that $E = \mu(3\lambda + 2\mu)/(\lambda + \mu)$ and $\nu = \lambda/[2(\lambda + \mu)]$
3. (Pr. 4.4., Elasticity, M. H. Sadd) Using the results of Exercise 4-3, show that $\mu = E/[2(1 + \nu)]$ and $\lambda = E\nu/[(1 + \nu)(1 - 2\nu)]$