Please answer these questions:

1) Dowling, Problem 4.6.

2) Consider a sample of titanium (Table 5.2) subjected to compression in the *z*-direction of 100 MPa and confined by a rigid die in the *x*- and *y*-direction so that it cannot deform in either of those directions as shown in Figure 1. (a) What are the stresses in the *x*- and *y*-directions? (b) What is the effective stiffness in the *z*-direction? (c) What is the volumetric strain? (d) What is the hydrostatic stress?
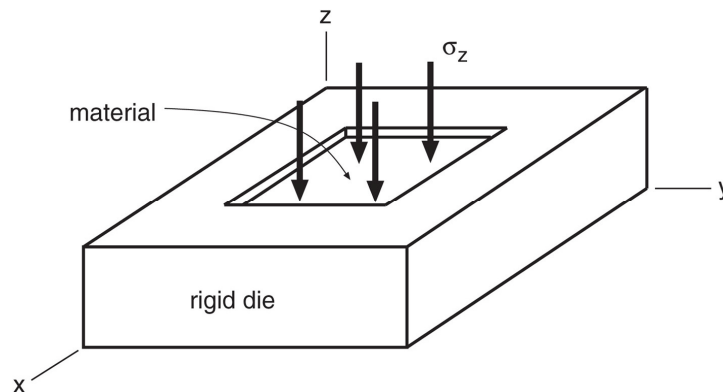

Figure 1. Material in rigid die subjected to compressive load σ_z.

A few solutions to the suggested problems in Dowling.

Dowling 4.9 Ans: E = 155.5 GPa, %el = 0.816% (at fracture), 0.48% (after fracture)
Dowling 5.16 Ans: ε_z = -737 $\mu\varepsilon$
Dowling 5.19 Ans: $\Delta r = pr^2(1-v)/(2tE)$
Dowling 7.23 assume σ_0 = -260 MPa, v = 0.293 in compression, Ans: (c) -444 MPa