7.32 We are asked in this problem to compute the critical resolved shear stress at a dislocation density of 10^6 mm^{-2}. It is first necessary to compute the value of the constant A (in the equation provided in the problem statement) from the one set of data as

$$A = \frac{\tau_{crss} - \tau_0}{\sqrt{\rho_D}} = \frac{0.69 \text{ MPa} - 0.069 \text{ MPa}}{\sqrt{10^4 \text{ mm}^{-2}}} = 6.21 \text{ x } 10^{-3} \text{ MPa} - \text{mm} \quad (0.90 \text{ psi} - \text{mm})$$

Now, the critical resolved shear stress may be determined at a dislocation density of 10^6 mm^{-2} as

$$\tau_{crss} = \tau_0 + A\sqrt{\rho_D}$$

$$= (0.069 \text{ MPa}) + \left(6.21 \text{ x } 10^{-3} \text{ MPa - mm}\right)\sqrt{10^6 \text{ mm}^{-2}} = 6.28 \text{ MPa} \quad (910 \text{ psi})$$