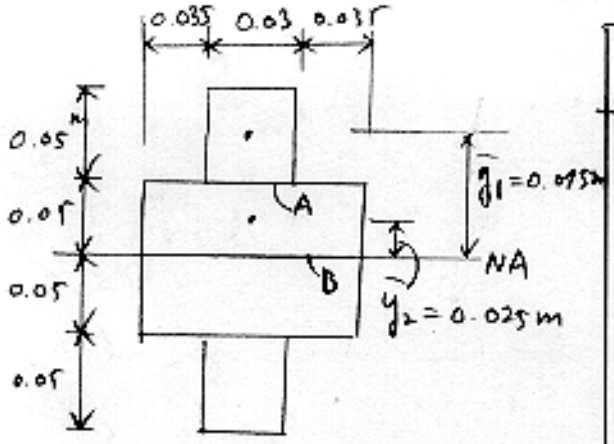
7-7



$$I = \frac{1}{12}(0.03)(0.2^3) + \frac{1}{12}(0.07)(0.1^3)$$
$$= 25.833\,(10^{-6})\ m^4$$

$$Q_A = \Sigma \bar{y}_i A_i = 0.095(0.03)(0.05)$$
$$= 0.1125\,(10^{-3})\ m^3$$

$$Q_B = \Sigma \bar{y}_i A_i = Q_A + 0.025(0.1)(0.05)$$
$$= 0.2375\,(10^{-3})\ m^3$$

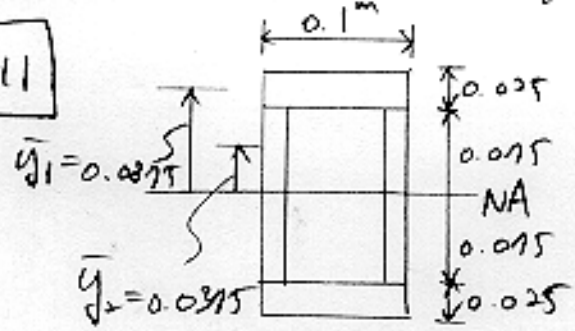
Allowable shear stress;

$$\tau_A = \frac{VQ_A}{It_A} = \frac{500(10^3)(0.1125)(10^{-3})}{25.833(10^{-6})(0.03)}$$
$$= \underline{12.6\ MPa}$$

$$\tau_B = \frac{VQ_B}{It_B} = \frac{500(10^3)(0.2375)(10^{-3})}{25.833(10^{-6})(0.1)}$$
$$= 4591\ MPa$$

Max $\tau_A = 12.6$ MPa

7-11



$$I = \frac{1}{12}(0.1)(0.2^3) - \frac{1}{12}(0.06)(0.15^3)$$
$$= 49.19167\,(10^{-6})\ m^4$$

$$Q_{max} = \Sigma \bar{y}_i A_i$$
$$= 0.0875(0.1)(0.025) + 0.0375(0.075)(0.04)$$
$$= 0.33125\,(10^{-3})\ m^3$$

$$\tau_{max} = \frac{VQ_{max}}{It}$$
$$= \frac{350(10^3)(0.33125)(10^{-3})}{49.19167(10^{-6})(0.04)}$$
$$= \underline{58.2\ MPa}$$