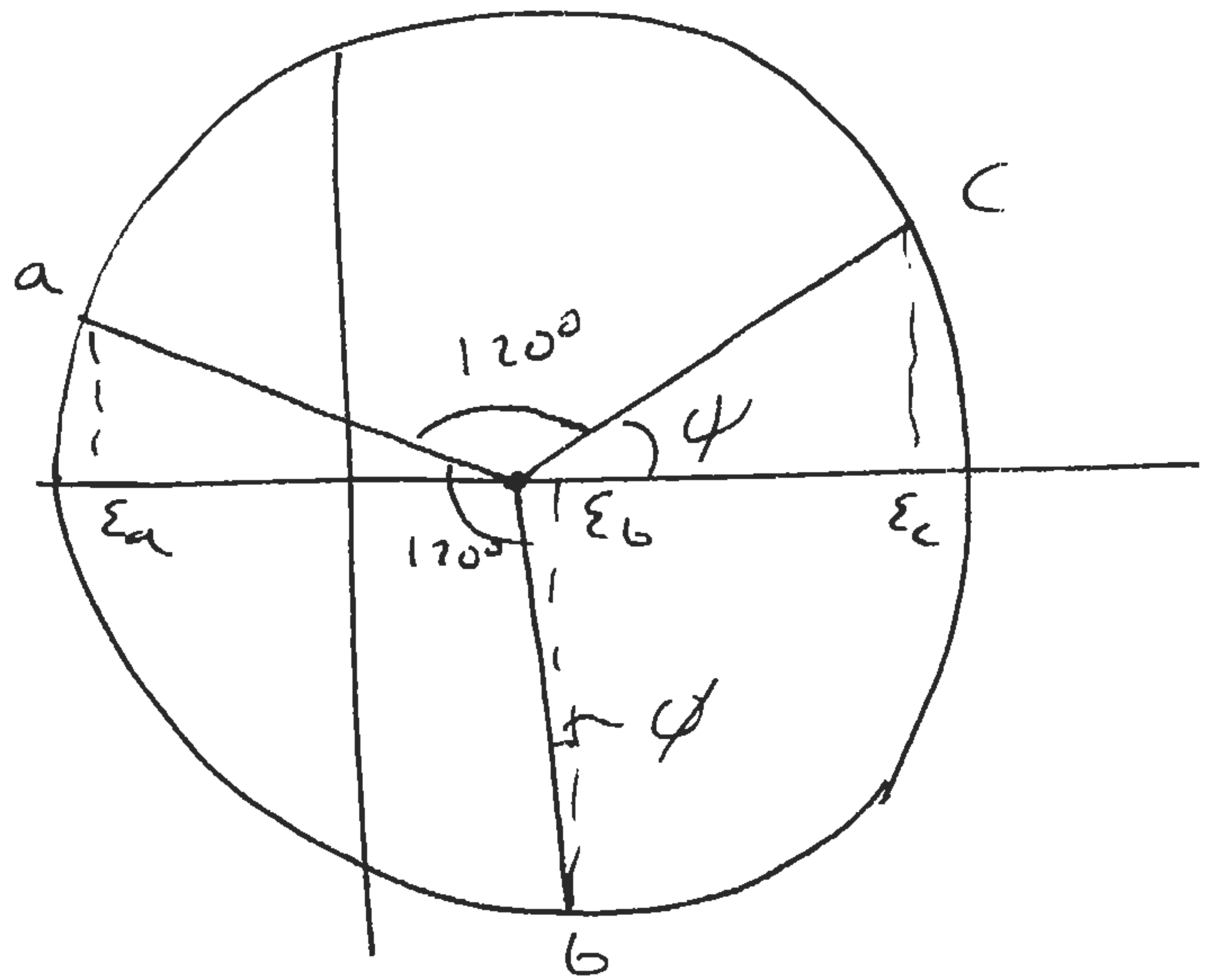
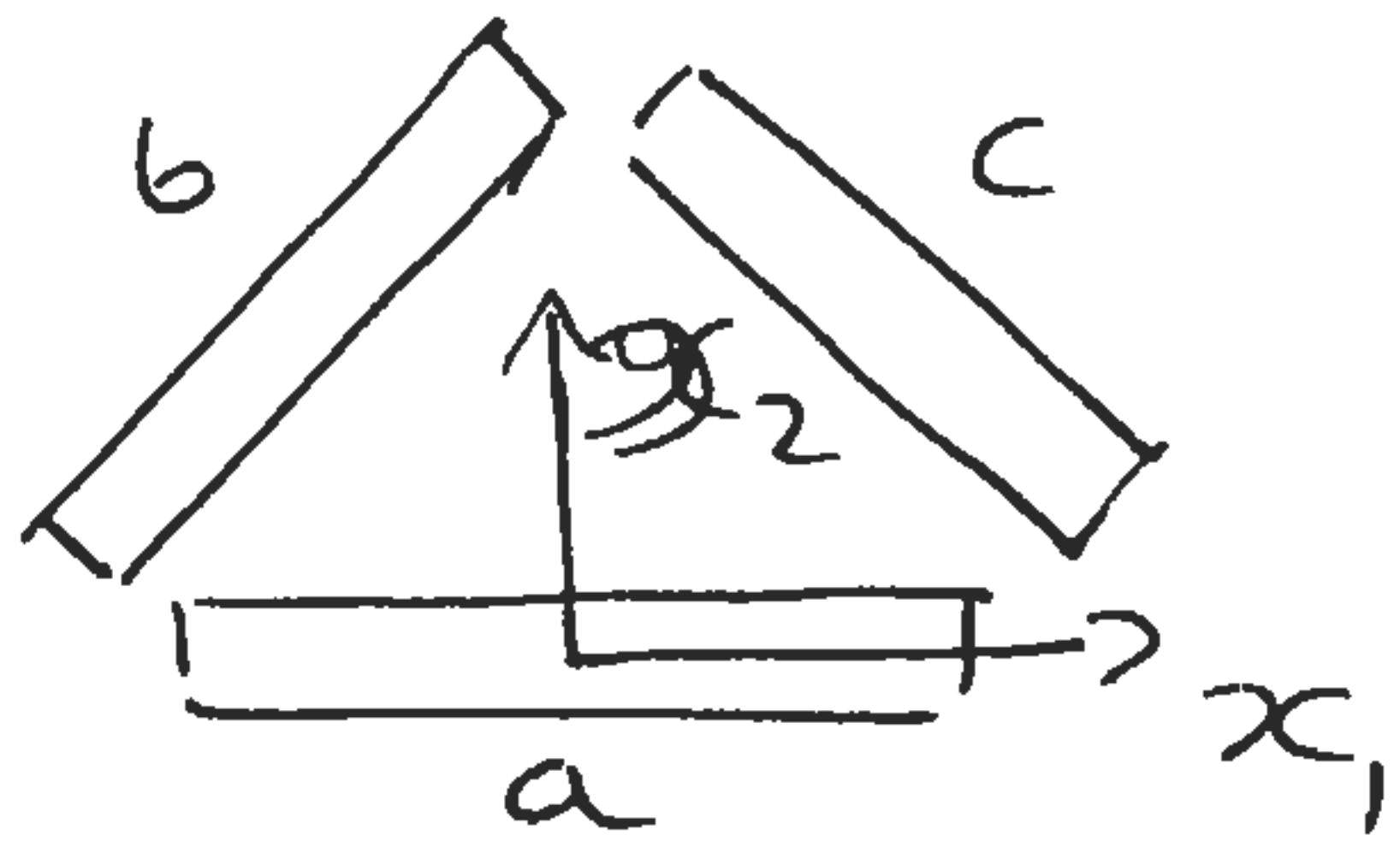


M17



Mohr's circles read

a) 60° rosette - plots as 120° on Mohr's circle

ϵ_a aligned with x_1 , \therefore reads $\epsilon_{11} = -200 \mu \epsilon \Leftarrow$

ϵ_b 60° ~~clockwise~~ counter clockwise

$$\text{angle } \phi = 120^\circ - 106.85^\circ = 13.15^\circ$$

$$\therefore \epsilon_b = \frac{100}{c} + \frac{361}{R} \sin 13.5^\circ = 182.1 \mu \epsilon \Leftarrow$$

$$\text{angle } \psi = 180 - 120 - 16.85 = 43.2^\circ$$

$$\epsilon_c = 100 + 361 \cos 43.2^\circ = 363.4 \mu \epsilon \Leftarrow$$

$$b) \quad \Sigma_{mn} = \begin{pmatrix} -200 & -200 & 0 \\ -200 & +400 & 0 \\ 0 & 0 & 0 \end{pmatrix}$$

Eq eigenvalues solution to $\Delta = |M - \lambda I|$

$$(-200 - \lambda)(+400 - \lambda) - (-200)^2 = 0$$

$$\lambda^2 - 200\lambda - 120000 = 0$$

$$\lambda = \frac{+200 \pm \sqrt{200^2 + 4 \times 120000}}{2}$$

$$= 100 \pm 361$$

$$= -261 \mu\epsilon \text{ and } +461 \mu\epsilon !! \leftarrow$$

$$c) \quad \text{for } \Sigma_{33} = 300 \mu\epsilon \text{ and } \Sigma_{23} = \Sigma_{13} = 0$$

Σ_{33} is a principal strain. (no associated shear)

$$\therefore \Sigma_I = 461 \mu\epsilon \text{ + } \Sigma_{II} = -261 \mu\epsilon \text{ as before}$$

$$\Sigma_{III} = 300 \mu\epsilon. \leftarrow$$