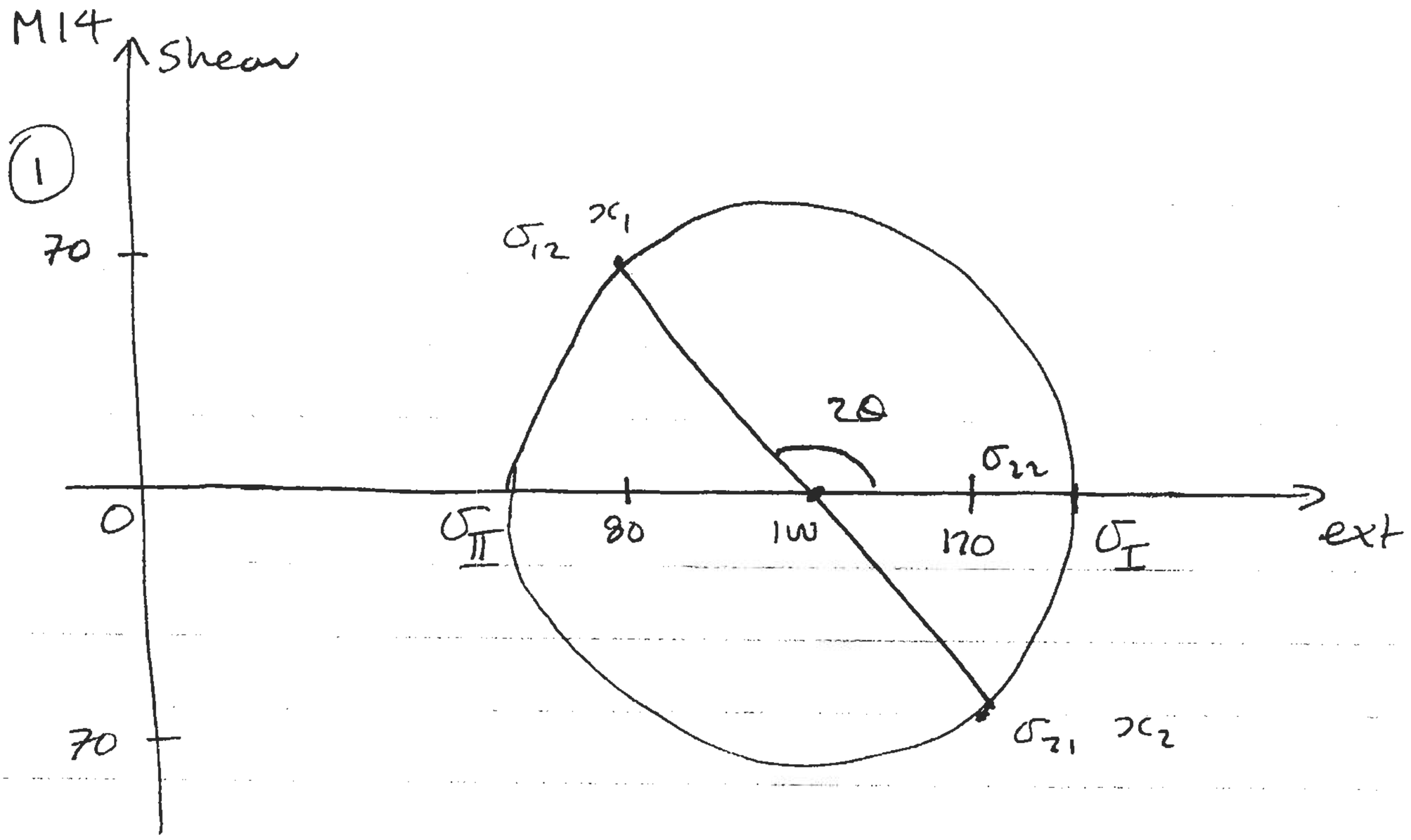


Radius = $\sqrt{20^2 + 70^2}$ = 72.8 MPa = Max Shear.

2) Max

Max Principal Stress = 100 + 72.8 = 172.8 MPa ⇐

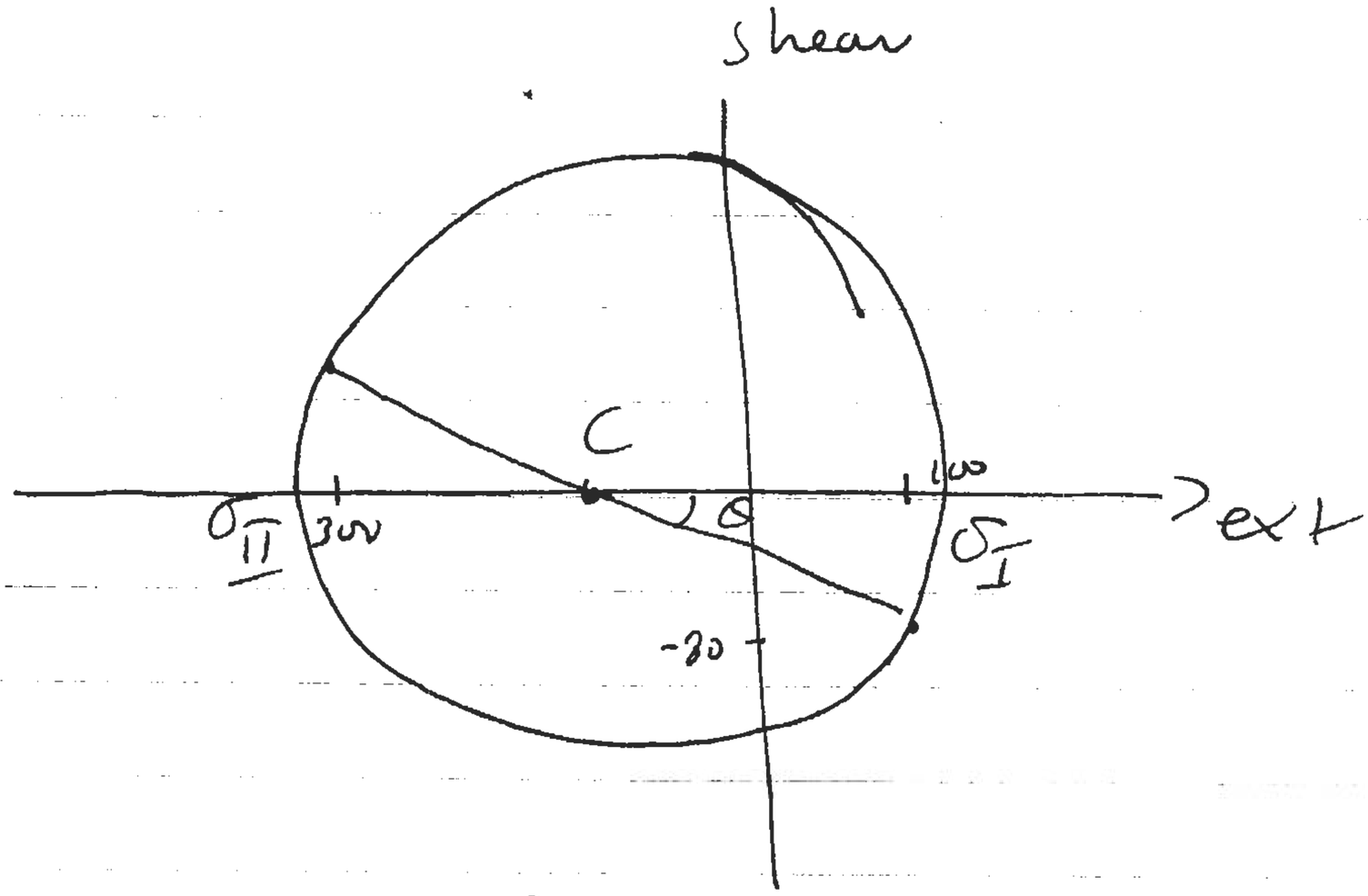
Min Principal Stress = 100 − 72.8 = 27.2 MPa ⇐

3) From σ_1 d^n

$2\theta = \frac{1}{2}\left(180 - \tan^{-1}\left(\frac{70}{20}\right)\right) =$ 53° clockwise fm σ_1

6)

1)



2) Center @ $\frac{100 + (-300)}{2} = -100\ MPa$

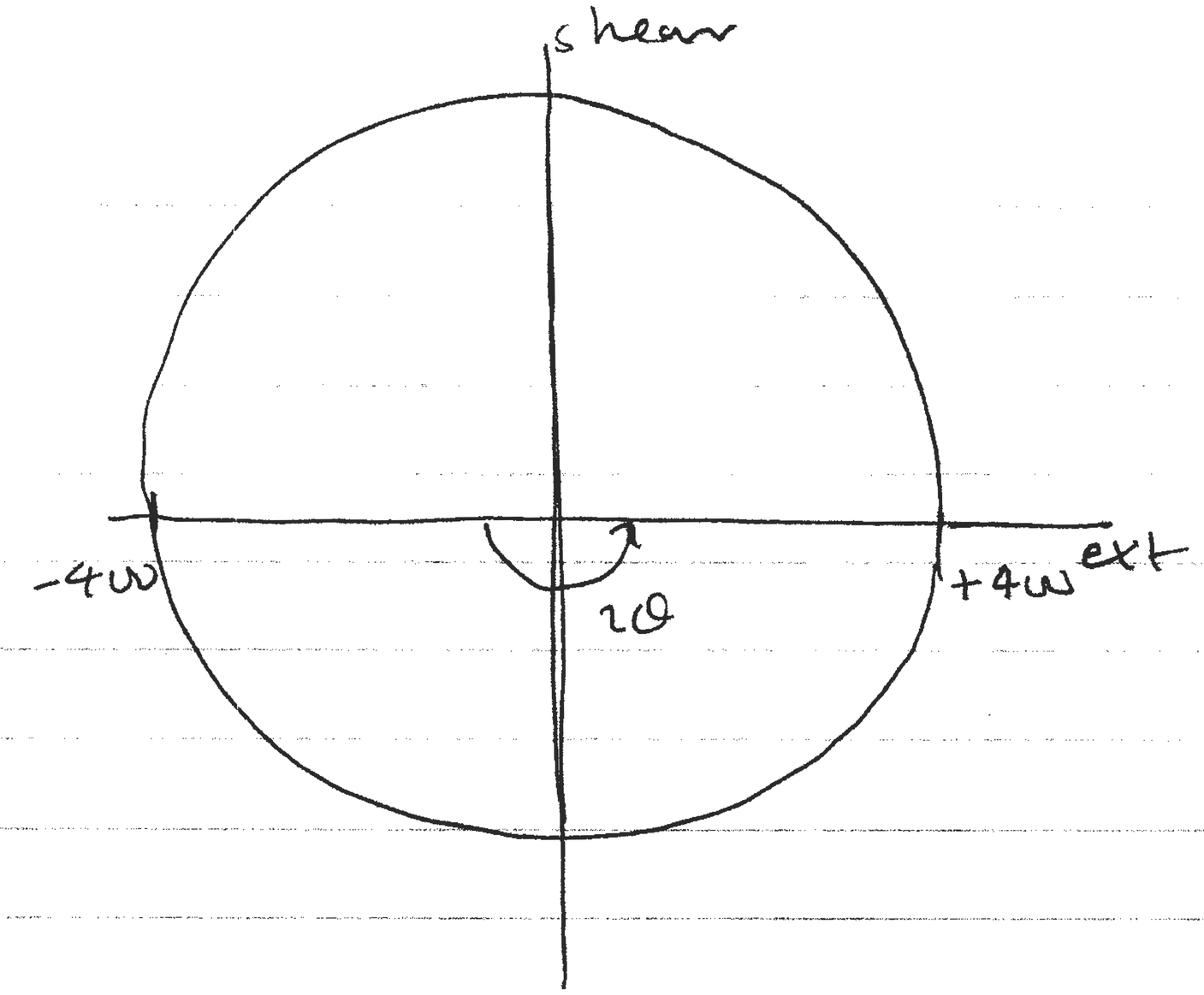
Radius $= \sqrt{200^2 + 80^2} = 215.4 MPa$ = Max Shear.

$\sigma_I = -100 + 215.4 = 115.4\ MPa$ ⟸

$\sigma_{II} = -100 - 215.4 = -315.4\ MPa$ ⟸

3) $\tan\theta = \frac{1}{2}\tan^{-1}\left(\frac{80}{200}\right) = 10.9°$ counterclockwise.

c)



center at origin

Max shear = 400 MPa

σ_I = 400 MPa

σ_{II} = -400 MPa

Max σ_I in x_2 direction ∴ 90° CCW from x_1