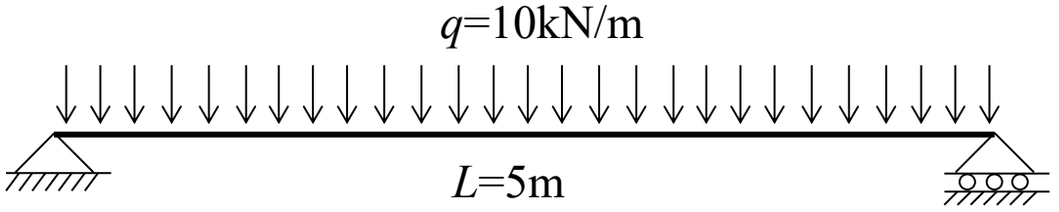
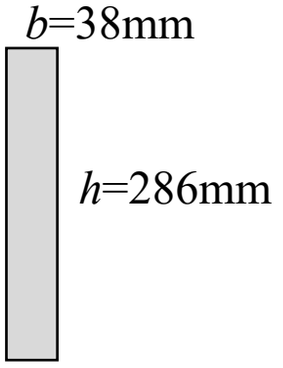
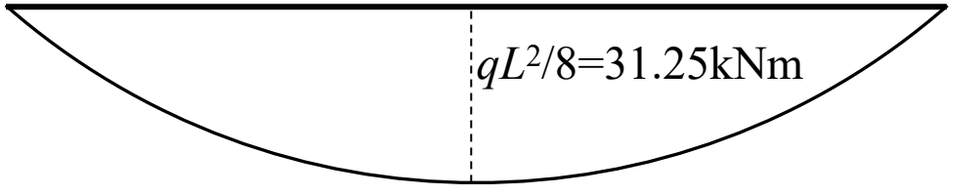
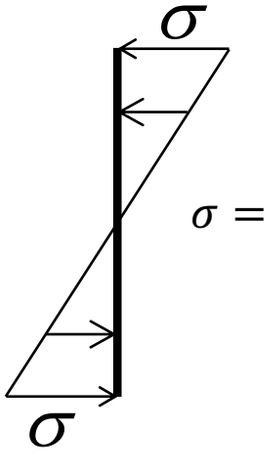
Simply Supported Beam



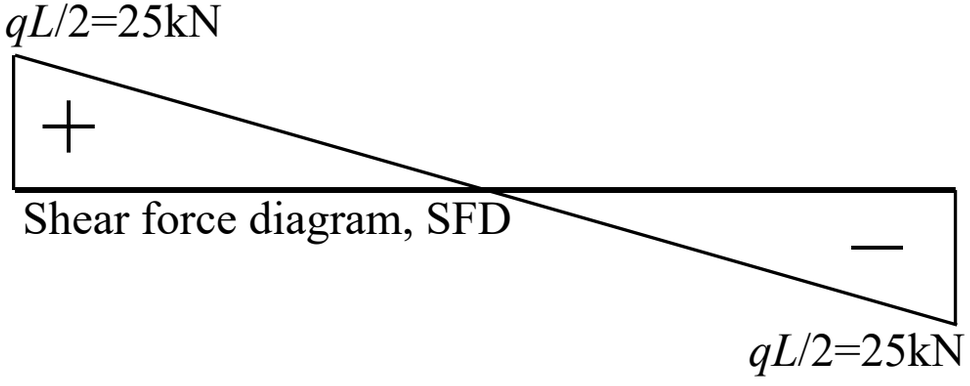


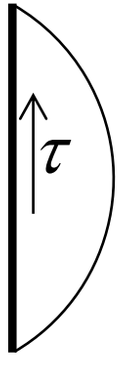
Bending moment diagram, BMD





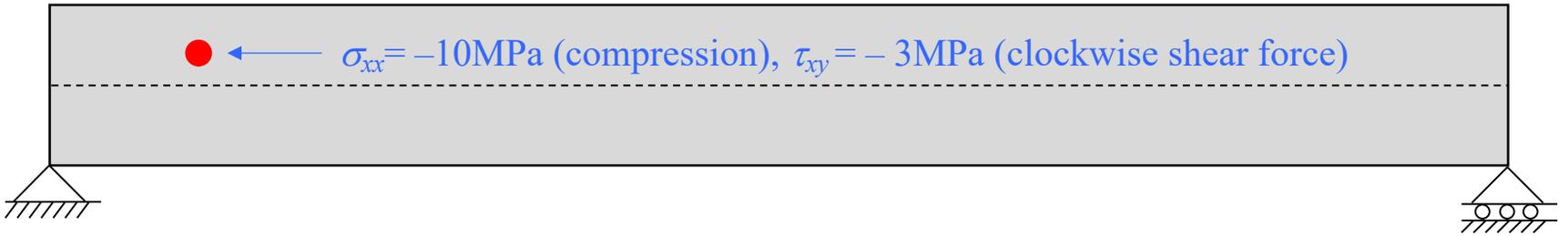
$$\sigma = \frac{M}{I} \cdot z = \frac{31.25}{\left(\frac{0.038 \cdot 0.286^3}{12}\right)} \cdot \frac{0.286}{2} = 60.3\text{MPa}$$





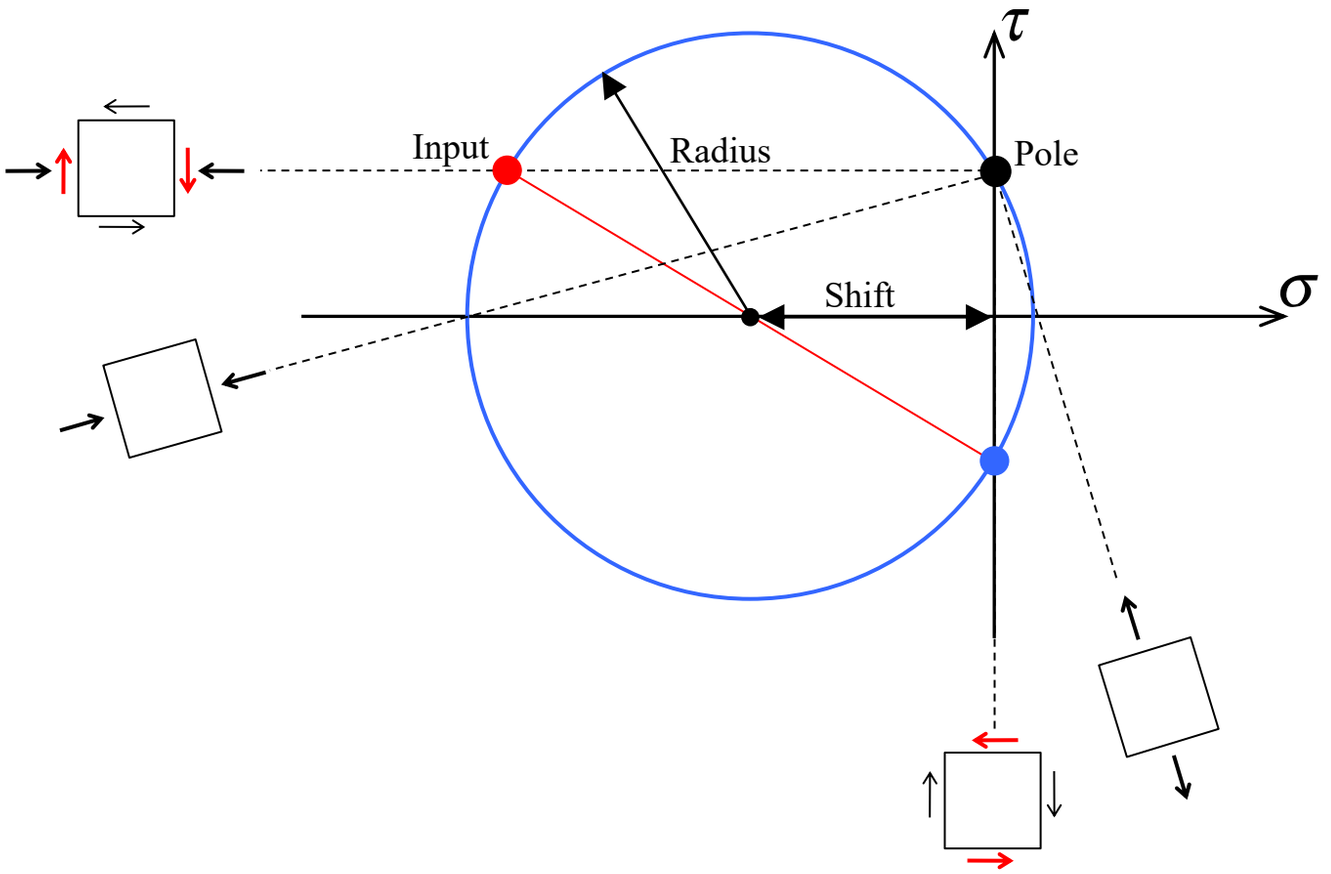
$$\tau = \frac{3}{2} \cdot \frac{V}{A} = \frac{3}{2} \cdot \frac{25}{0.038 \cdot 0.286} = 3.45\text{MPa}$$

Upper-left

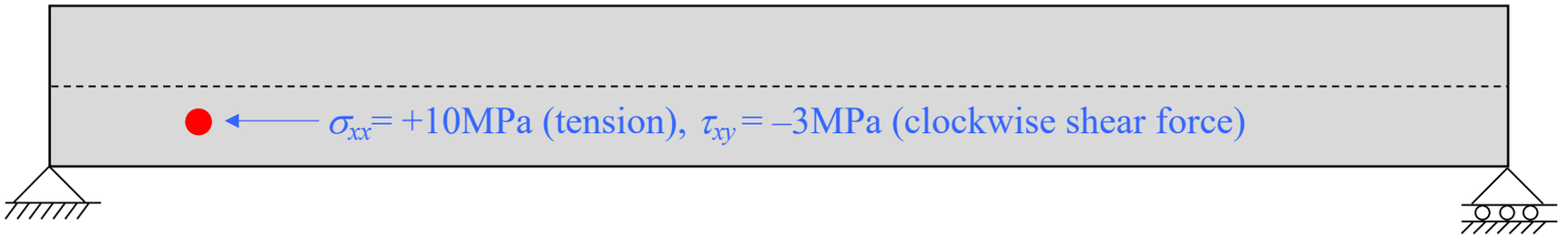


$$\text{Shift} = \frac{\sigma_{xx} + \sigma_{yy}}{2} = \frac{-10 + 0}{2} = -5$$

$$\text{Radius} = \sqrt{\left(\frac{-10 + 0}{2}\right)^2 + (-3)^2} = 5.83$$

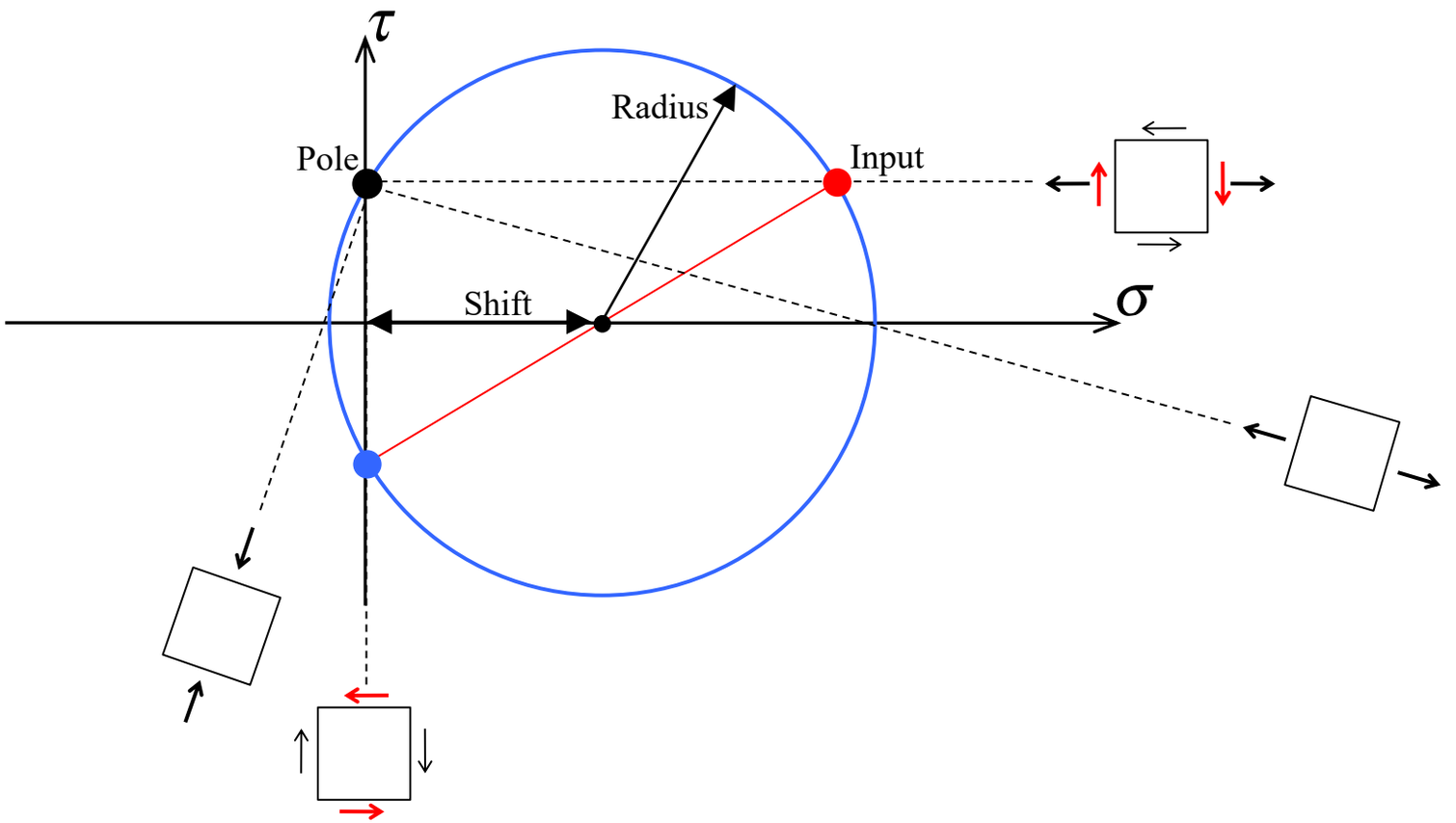


Lower-left

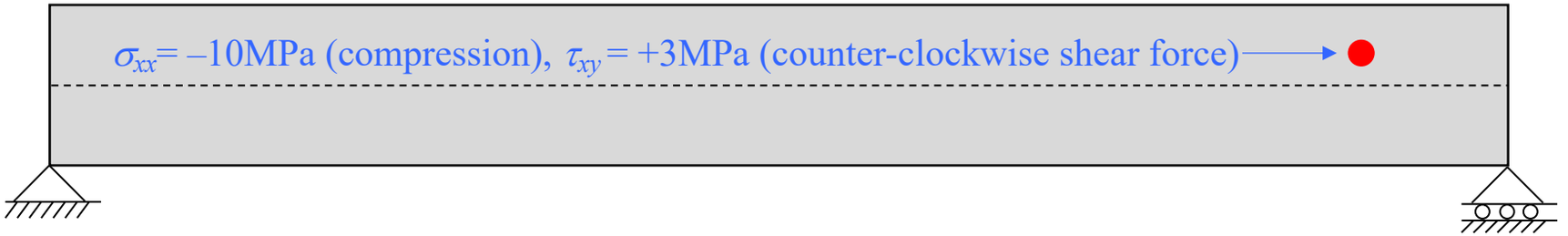


$$\text{Shift} = \frac{\sigma_{xx} + \sigma_{yy}}{2} = \frac{10 + 0}{2} = 5$$

$$\text{Radius} = \sqrt{\left(\frac{10 + 0}{2}\right)^2 + (-3)^2} = 5.83$$

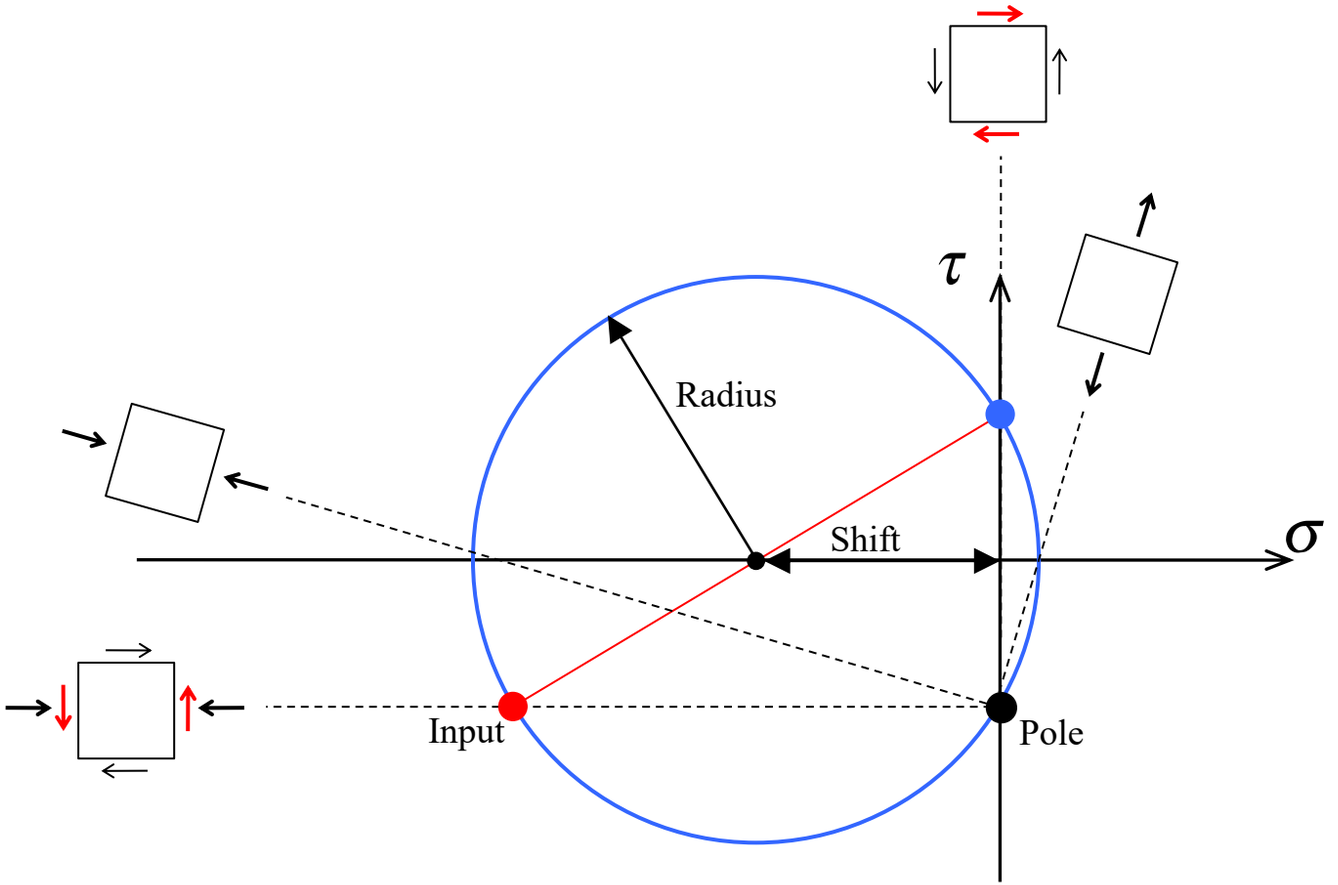


Upper-right

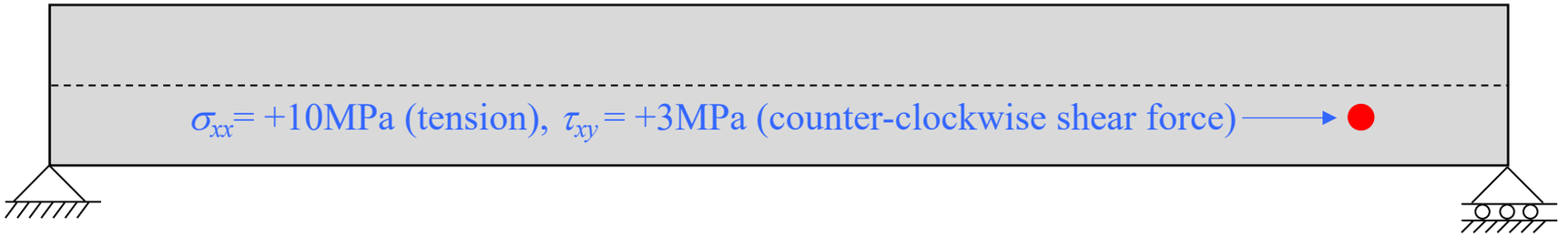


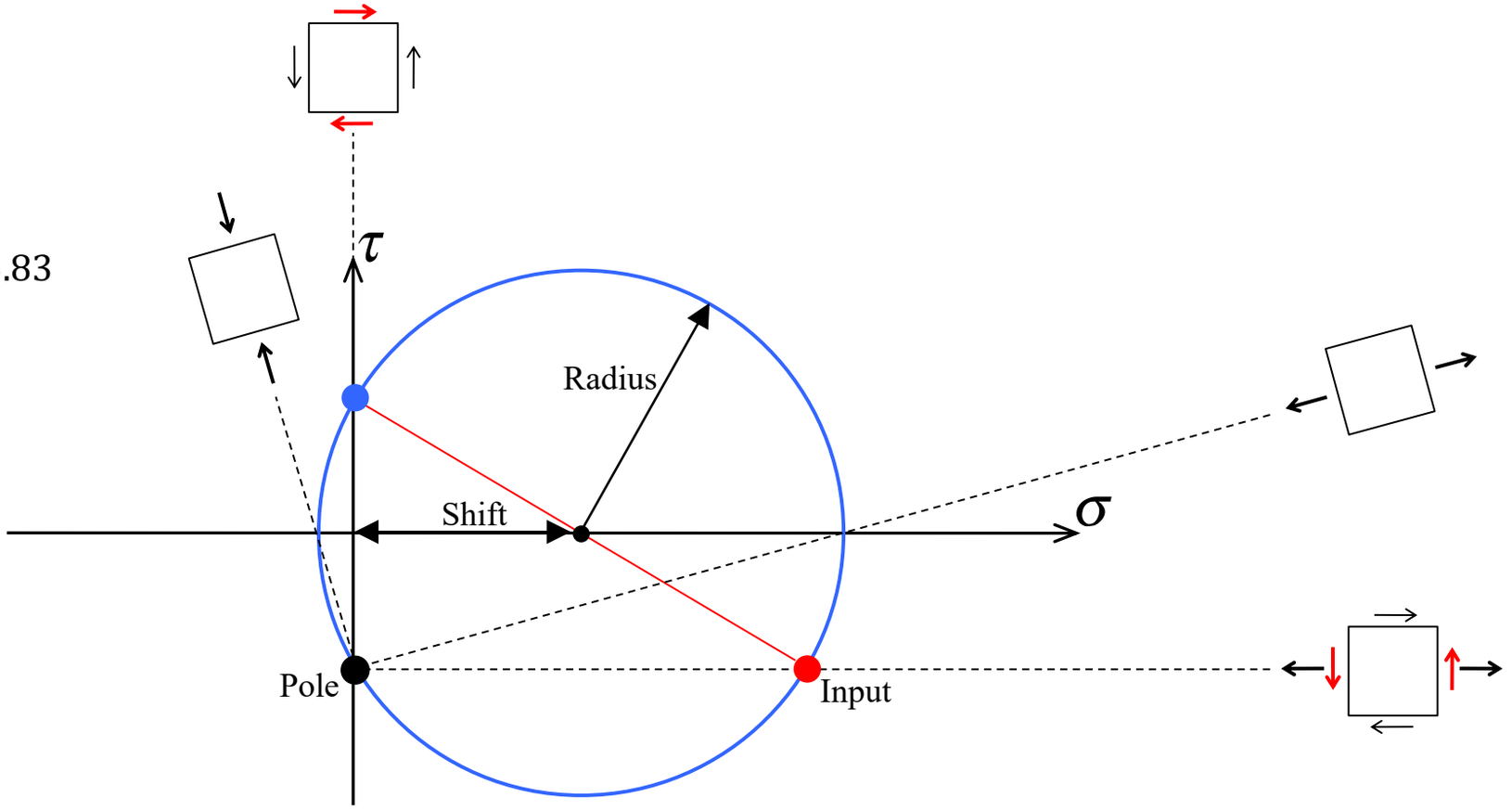
$$\text{Shift} = \frac{\sigma_{xx} + \sigma_{yy}}{2} = \frac{-10 + 0}{2} = -5$$

$$\text{Radius} = \sqrt{\left(\frac{-10 + 0}{2}\right)^2 + (3)^2} = 5.83$$



Lower-right



$$\text{Shift} = \frac{\sigma_{xx} + \sigma_{yy}}{2} = \frac{10 + 0}{2} = 5$$

$$\text{Radius} = \sqrt{\left(\frac{10 + 0}{2}\right)^2 + (3)^2} = 5.83$$