

Quiz #5 – 9:30 section

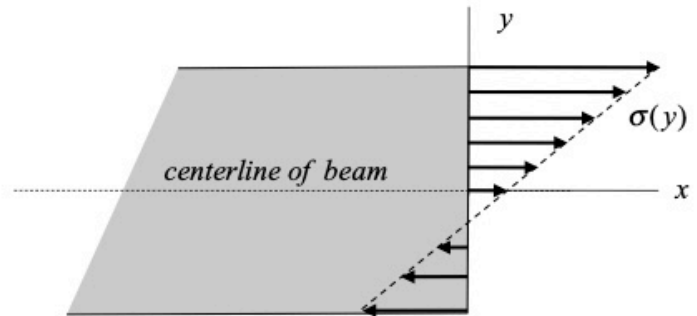
Q1

Conceptual question 10.1

The distribution of the normal stress σ at the cross section of a beam varies linearly with the coordinate y and is constant in its depth (in z -direction). Let F represent the resultant normal force due to this normal stress on the cross section. Circle the correct answer:

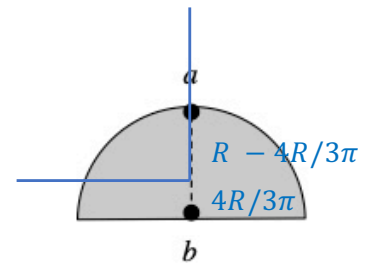
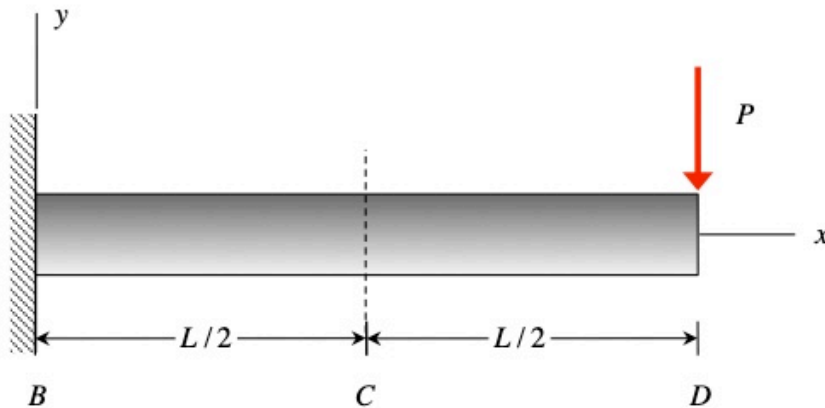
- a) $F > 0$ (tensile)
- b) $F = 0$
- c) $F < 0$ (compressive)

$$F = \int \sigma dA > 0$$



Q2

Conceptual question 10.8



beam cross section at C

Consider the cantilevered beam above with the concentrated load P at end D. Consider the axial components of stress at points “a” and “b” (σ_a and σ_b , respectively) at location C along the beam. Circle the response below that most accurately describes the relative sizes of the magnitudes of these two stresses:

a) $|\sigma_a| > |\sigma_b|$

$$|\sigma_a| = \left(R - \frac{4R}{3\pi}\right) M/I$$

b) $|\sigma_a| = |\sigma_b|$

$$|\sigma_b| = \left(\frac{4R}{3\pi}\right) M/I$$

c) $|\sigma_a| < |\sigma_b|$