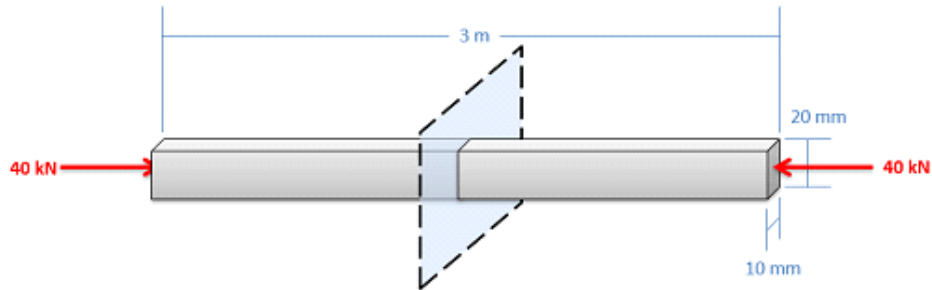# Problem 1

A steel beam measuring 10 mm wide by 20 mm tall by 3 m long is subjected to a compressive load of 40,000 Newtons as shown below. What is the average compressive stress in a cross section of the beam to the forces?

$$\sigma = \frac{N}{A}$$

$$\sigma = \frac{40,000 \text{ N}}{(.01m)(.02m)} = 2 \times 10^8 \frac{N}{m^2}$$

$$\boxed{\sigma = 200 \text{ MPa}}$$