Remarks: See §4.4, pages 168 till 170

Answer:

$F = 24$ kN

Explanation:

At the left edge $\sigma = 0$; There are two contributions to the stress:

Due to G: $\sigma_1 = -\dfrac{G}{bh}$

Due to F: $\sigma_2 = -\dfrac{F}{bh} + \dfrac{(F \cdot \frac{1}{2}h)(\frac{1}{2}h)}{\frac{1}{12}bh^2} = -\dfrac{F}{bh} + 3\dfrac{F}{bh} = 2\dfrac{F}{bh}$

$-\dfrac{G}{bh} + 2\dfrac{F}{bh} = 0 \ \Rightarrow\ F = \tfrac{1}{2}G$