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Practice Problems - A1

1. The plain concrete beam shown in figure is used on a 6'-6" simple span. The concrete is normal weight (unit weight = 150 pcf) with $f'_c = 3000$ psi.
   (a) Calculate the cracking moment, $M_{cr} (k$-ft$)$
   (b) Calculate the self weight of the beam, (k/ft)
   (c) Calculate $w$ (k/ft) that would cause the concrete beam to crack.

2. Calculate the cracking moment strength, $M_{cr}$ for the beam cross-section shown. $f'_c = 3000$ psi, normal weight concrete (unit weight=150 pcf).
   Determine the maximum simply supported span length at which the beam will fail due to its own weight.