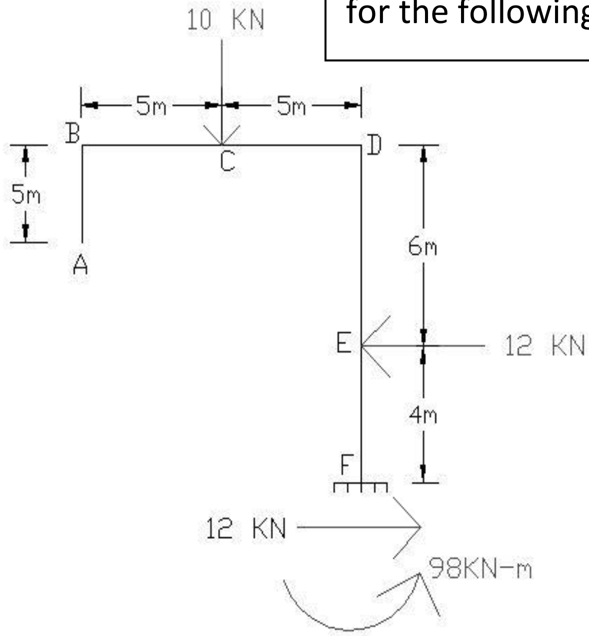
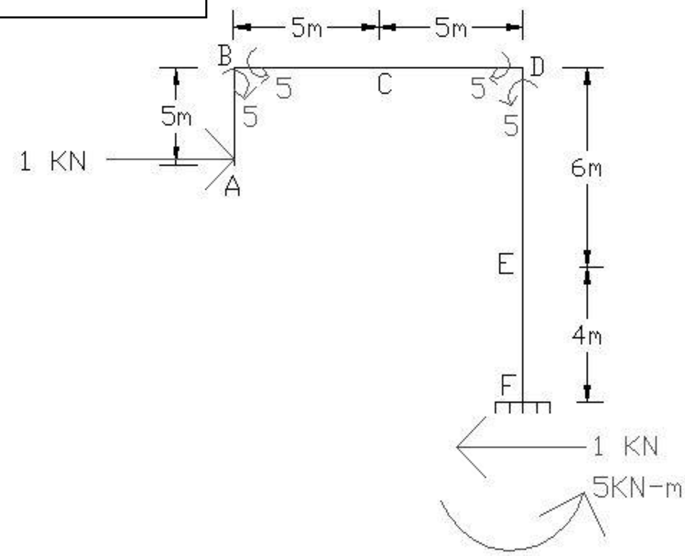
Find horizontal deflection at A, Δ_A (h) and rotation at A, θ_A for the following figure





For M_0

For M_1

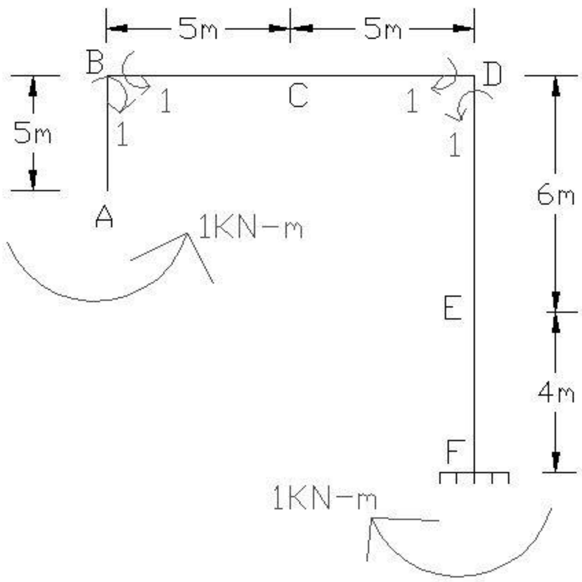
<u>Finding horizontal deflection at A, Δ_A (h)</u>

Δ_A EI $= \int_0^{5\,(A\to B),(B\to C)} 0dx + \int_0^{5\,(C\to D)} (-10x)(-5)dx + \int_0^{4\,(F\to E)} (12x - 98)(5 - x)dx + \int_0^{6\,(E\to D)} \{-12x + 12(x+4) - 98\}\{-1(x+4) + 5\}dx$

$= 625 - 952 + 600$

$= 273$

Δ_A (horizontal) $= \dfrac{273}{EI}\, m$ (to the right)



Finding rotation at A, θ $_A$

$\theta_A EI = \int_0^{5\ (A\to B),(B\to C)} 0dx + \int_0^{5\ (C\to D)} (-10x)(-1)dx + \int_0^{4\ (F\to E)} (12x - 98)(-1)dx + \int_0^{6\ (E\to D)} \{-12x + 12(x+4) - 98\}(-1)dx$

$= 0 + 125 + 296 + 300$

$= 721$

$\boxed{\theta_A = \frac{721}{EI}\ rad\ (anticlockwise)}$

Credit: Ashif Istiaque Dhrubo, Edited by Dr. Latifee,

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