Quiz 5

Thursday, October 22, 2020 3:56 PM

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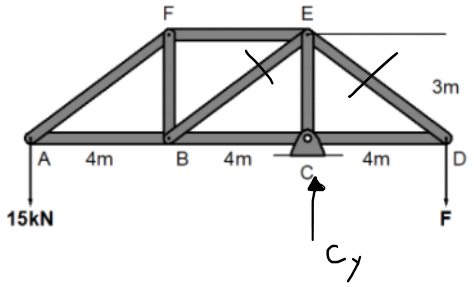
1. The truss below is used to lift a load of **15kN** with an unknown load of **F** applied at point **D**. To receive full credit you must show all necessary free body diagrams. Note you may need to use both method of sections and method of joints.
   a. Determine the reactions at point **C** and the unknown load **F**.
   b. Determine the force in members **DE, BE** and **FE** and state whether they are in tension or compression



A.)

$F_y = 0$

$C_y - 15 - F = 0$

$C_y = F + 15$

$C_y = (30) + 15$

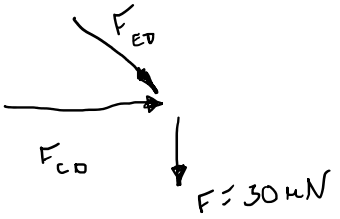
$C_y = 45\ kN$

$M_C = 0$

$15(8) - F(4) = 0$

$F = 30\ kN$

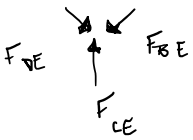
B.)



$F_y = 0$

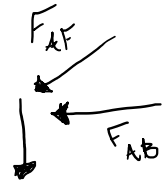
$-30 - F_{DE}\left(\frac{3}{5}\right) = 0$

$F_{DE} = 50\ kN$ in tension



$F_{BE} = F_{DE}$

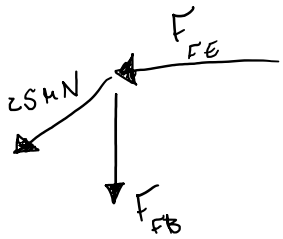
$F_{BE} = 50\ kN$ in tension



$F_y = 0$

$-15 - F_{AF}(3/5) = 0$

$F_{AF} = -25\ kN$



$$F_y = 0$$

$$F_{FE} - 25\left(\frac{4}{5}\right) = 0$$

$F_{FE} = 20$ kN in tension