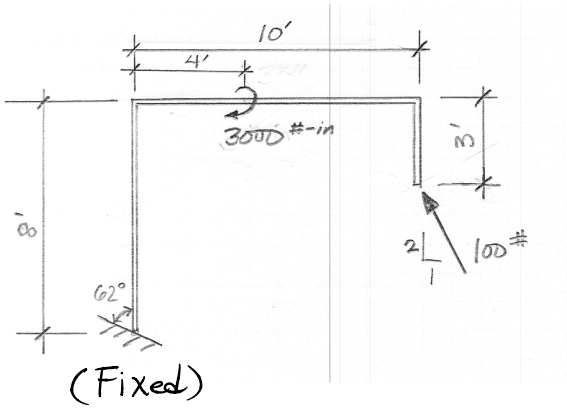
For the structure shown below:

a) Draw the complete FBD

b) Solve for the unknown reaction forces

c) Do an independent statics check on your answer

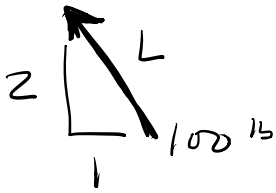


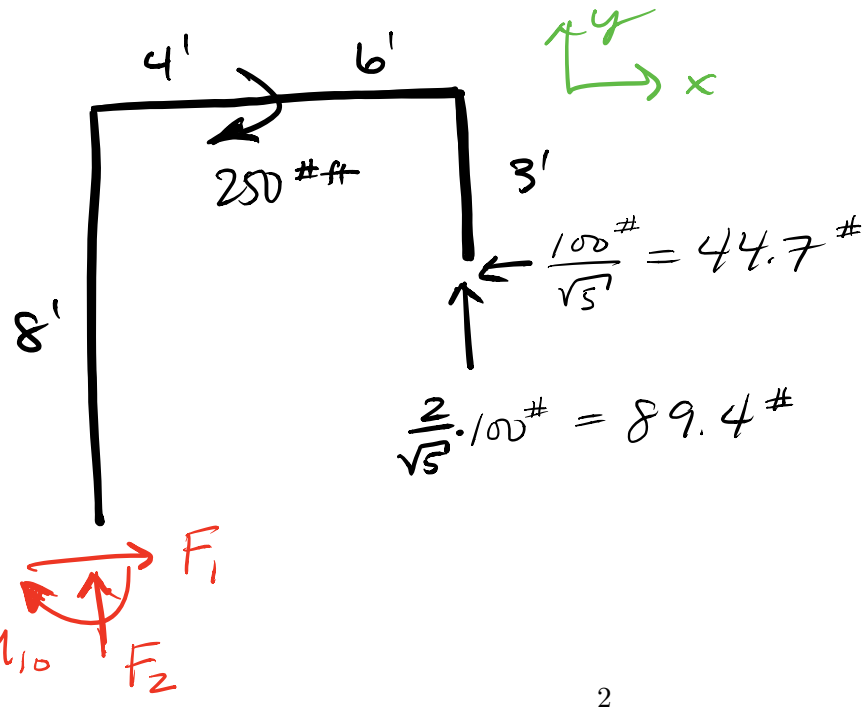
SOLUTION: #UPD: 16

$$3000\ \#\text{-in} \times \frac{1\ ft}{12\ in} = 250\ lb\text{-}ft$$

GEOMETRY: $1^2 + 2^2 = L^2$

$$5 = L^2 \Rightarrow L = \sqrt{5}$$





EQUILIBRIUM:

$\circlearrowleft + \Sigma M_{\text{AT GROUND}} = 0$

$M_{10} + 250\ \text{lb ft} - 44.7\ \text{lb} \cdot (8' - 3') - 89.4\ \text{lb} \cdot 10' = 0$

$M_{10} = 867.5\ \#ft$ or $867.5\ \text{lb ft}\ \circlearrowright$

$\overset{+}{\rightarrow} \Sigma F_x = 0$

$F_1 - 44.7\# = 0$

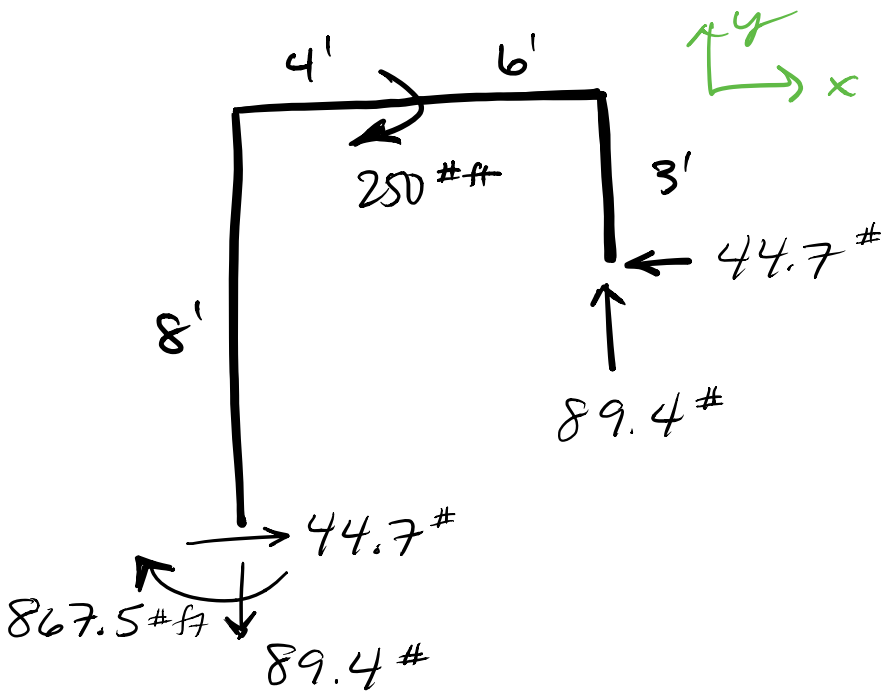
$F_1 = 44.7\#$

$+\downarrow \Sigma F_y = 0$

$-F_2 - 89.4\# = 0$

$F_2 = -89.4\#$ or $89.4\# \downarrow$

SOLVED FBD



INDEP. CHECK:

$\circlearrowleft +\Sigma M_{\text{upper Rt. corner}} = 0$

$867.5\ \#ft - 89.4\ \#\cdot 10' + 250\ \#ft$

$+ 44.7\ \#(3') - 44.7\ \#(8') = 0$

$0 \approx 0$ ✓✓