University of Maryland
ENCE353: Introduction to Structural Analysis

Fall 2015

Name: _____

Name: _____

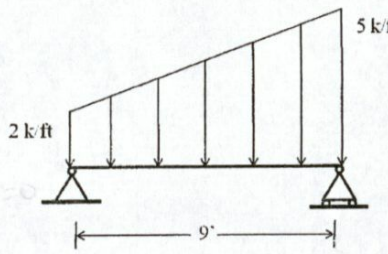
In-Class Problems #1

1. What does it mean for a structure to be considered *statically determinate / indeterminate*

Determinate: all reactions and internal forces in the structure can be determined from equilibrium equations.

Indeterminate: more unknown reactions and internal forces than equilibrium equations.

2. Draw the resultant forces due to the distributed loading



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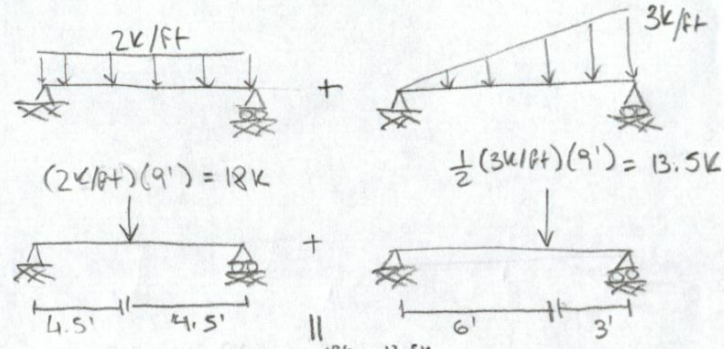


$\xrightarrow{+} \Sigma F_x = 0$

$A_x = 0$

$+\circlearrowleft \Sigma M_A = 0$

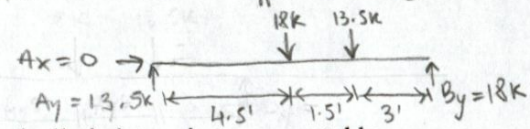
$-(18k)(4.5') - (13.5k)(6') + B_y(9') = 0$

$B_y = 18k$

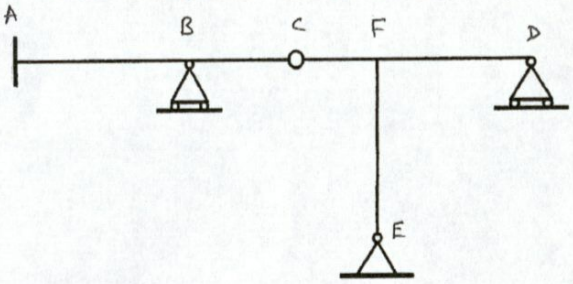
$+\uparrow \Sigma F_y = 0$

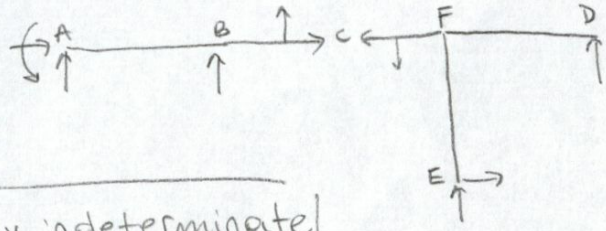
$A_y - 18k - 13.5k + 18k = 0$

$A_y = 13.5k$



3. Classify the structure as statically determinate, statically indeterminate, or unstable





$r = 9$

$n = 2$

$3n = 6$

$r > 3n \rightarrow$ statically indeterminate to the 3rd degree

Degree of indeterminacy $= r - 3n = 9 - 6 = 3$