CE 333 Statics

Exam #1

Name: ANSWERS ONLY

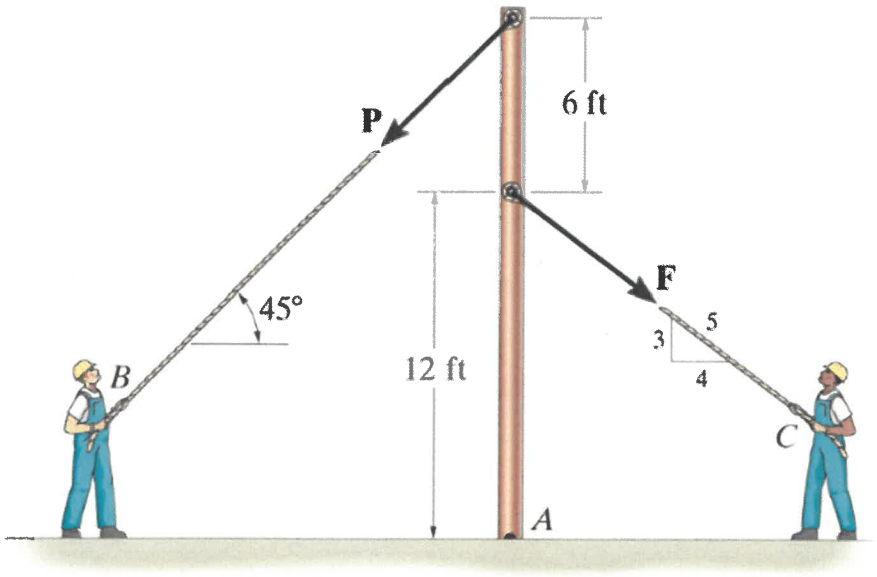
INSTRUCTIONS:
Please thoroughly read each problem before solving it. You must show all steps and proper units to receive credit for your answer. Be sure to BOX your final answers in. Time limit: 75 minutes
GOOD LUCK!

#1	_____/10 Points	#4	_____/10 Points
#2	_____/10 Points	#5	_____/10 Points
#3	_____/10 Points	#6	_____/10 Points
			_____/60 Points

"On my Honor, as a student I have neither given nor received unauthorized aid on this exam. I also will not discuss the contents of this exam with anyone until after the exams have been returned."

Signed: _____

Problem #1 (10 Points)
Two men exert forces of F=80 lb and P=50 lb on the ropes. Determine the moment of each force about A. Which way will the pole rotate, clockwise or counterclockwise?



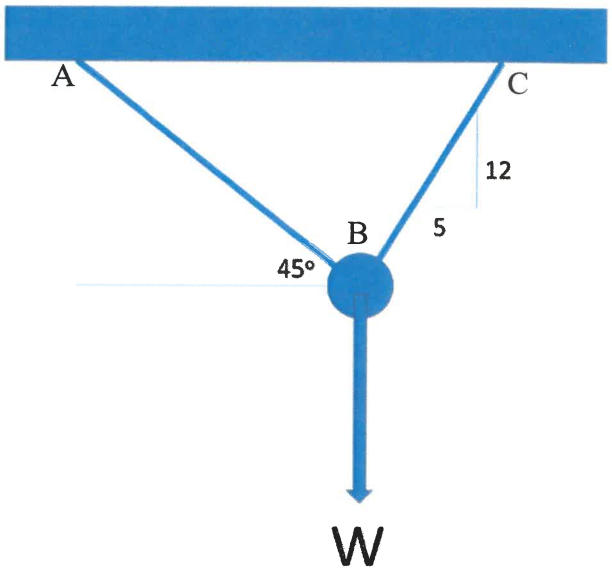
FOR P $M_A = 636$ #-ft (CCW)

FOR F $M_A = 768$ #-ft (CW)

$M_{CW} > M_{CCW}$

CW ROTATION

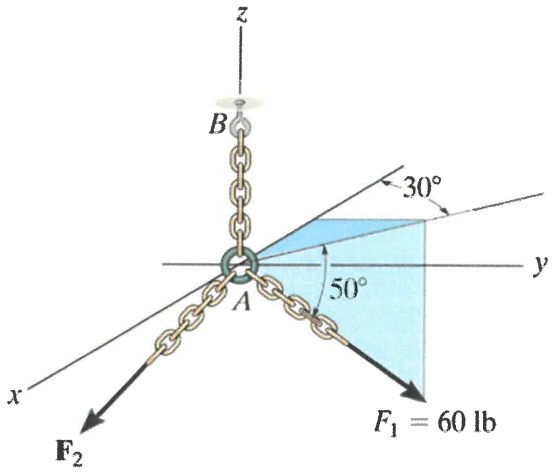
Problem #2 (10 Points)
If each cord (CB & AB) can sustain a maximum tension of 15 pounds before it fails (this does not mean each cable has 15 pounds of tension applied), determine the greatest weight (W) the cords can support.



$W = 19.6\#$

Problem #3 (10 Points)

The two forces $\mathbf{F_1}$ and $\mathbf{F_2}$ have a resultant force of $\mathbf{F_R} = \{-100\mathbf{k}\}$ lb. Determine the magnitude and coordinate direction angles of $\mathbf{F_2}$.



$\vec{F}_2$ MAG = 66#

$\theta_x = 60°$

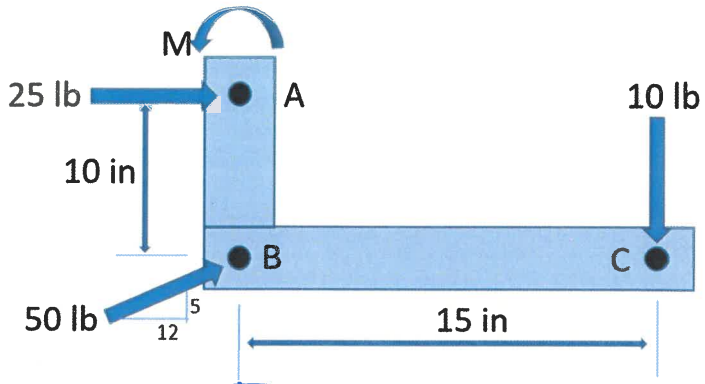
$\theta_y = 107°$

$\theta_z = 145°$

Problem #4 (10 Points)

A couple of magnitude M=30 lb*in and three forces shown are applied to an angle bracket

A. Find the resultant of the system of forces (This includes magnitude and direction)
B. Located the points where the line of action of the resultant intersects AB (Measured from point B).

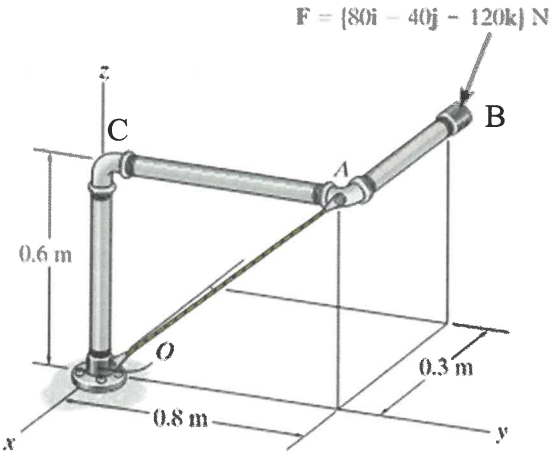


A: R = 72# 7.2°

B: 5.2" ABOVE B

Problem #5 (10 Points)

1. Determine the moment of force F about point C. Express in Cartesian vector format
2. Determine the moment of F about the x axis.
3. Determine the moment of F about an axis extending between O and A.

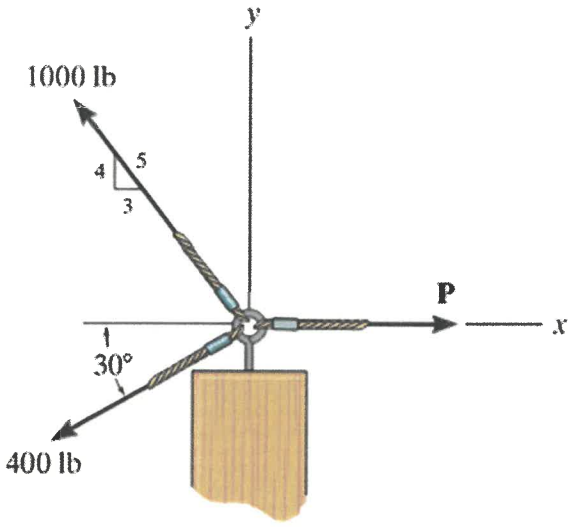


1: $M_C = \{-96i - 36j - 52k\}$ N·m

2: $M_{X\text{-AXIS}} = -72$ N·m

3: $M_{OA} = -21.6$ N·m

Problem #6 (10 Points)
The three cable forces act on the eyebolt. Determine two possible magnitudes for **P** so that the resultant force (not shown) has a magnitude of 800 N.



P = 1475 #, 417 #

EXTRA ROOM IF NEEDED