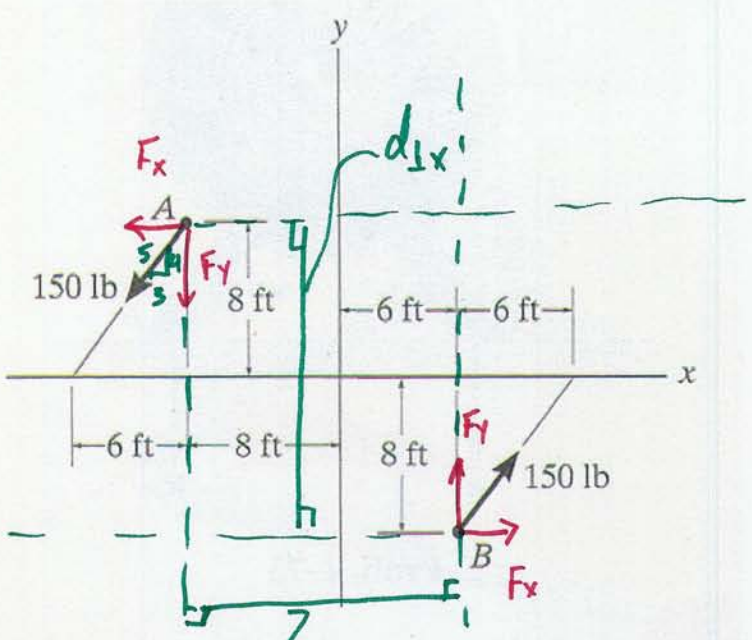
Worksheet 4

Problem 1 – Couples

Determine the magnitude and sense of the couple moment.



Scalar

$C = F_x d_{\perp x} + F_y d_{\perp y}$

$F_x = 150(\frac{3}{5}) = 90$ lb

$F_y = 150(\frac{4}{5}) = 120$ lb

$d_{\perp x} = 16$ Ft

$d_{\perp y} = 14$ Ft

$\circlearrowleft C = 90(16) + 120(140)$

$= 3120$ lb·Ft $\circlearrowleft$

$= 3.12$ Kip Ft $\circlearrowleft$

VECTOR

$\vec{C} = \vec{r}_{AB} \times \vec{F}_B = \vec{r}_{BA} \times \vec{F}_A$

$\vec{r}_{AB} = [14 \ -16]$

$\vec{F}_B = [90 \ 120]$

$\vec{C} = [14 \ -16] \times [90 \ 120]$

$= [0 \ 0 \ 3120]$

OR $\vec{r}_{BA} = [-14 \ 16]$ $\vec{F}_A = [-90 \ -120]$

$\vec{C} = [-14 \ 16] \times [-90 \ -120] = [0 \ 0 \ 3120]$

$\vec{C} = [0 \ 0 \ 3.12]$ Ft·K