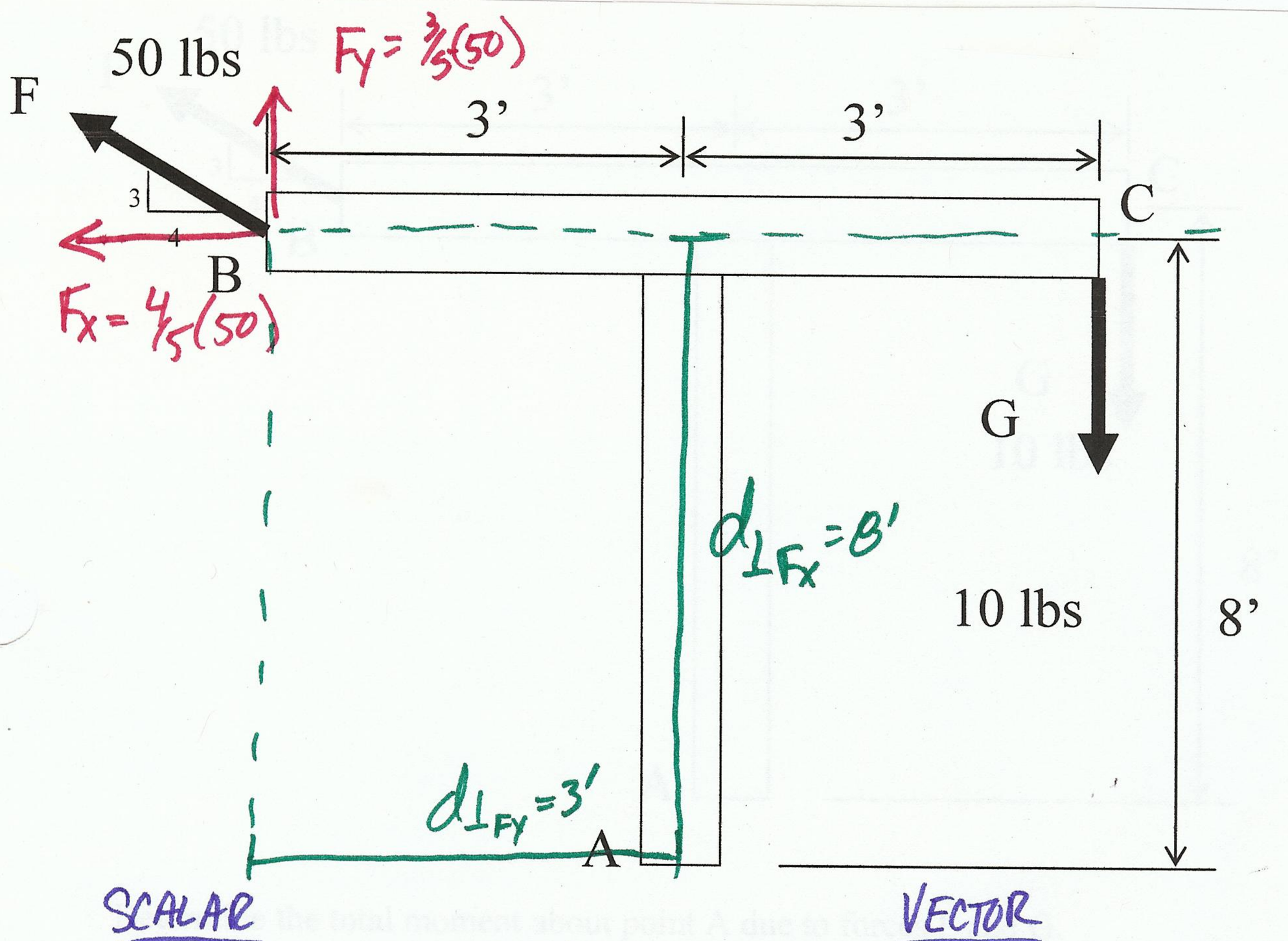
Worksheet 3

Problem 1 – 2D Moments *(Formerly Worksheet 2 Problem 2)*



SCALAR

$G: \quad M_A = d_{1_G} G = (3')(10 \text{lbs}) = 30 \text{ Ft·lbs} \circlearrowright$

$F: \quad M_A = d_{1_{Fx}} F_x + d_{1_{Fy}} F_y$

$= (8')(\frac{4}{5}(50)) + (3')(\frac{3}{5}(50))$

$= 320 \text{ Ft·lb} \circlearrowleft + 90 \text{ Ft·lb} \circlearrowright$

$\Sigma M_A = 30 \circlearrowright + 320 \circlearrowleft + 90 \circlearrowright$

$M_A = 200 \text{ Ft·lb} \circlearrowleft \text{ ABOUT A}$

VECTOR

$\vec{m}_A = \vec{r}_{AB} \times \vec{F} + \vec{r}_{AG} \times \vec{G}$

$\vec{r}_{AB} = [-3 \; 8]$

$\vec{r}_{AG} = [3 \; 8]$

$\vec{F} = 50[-\frac{4}{5} \; \frac{3}{5}] = [40 \; 30]$

$\vec{G} = [0 \; -10]$

$\vec{m}_A = [-3 \; 8] \times [-40 \; 30] + [3 \; 8] \times [0 \; -10]$

$\vec{m}_A = [0 \; 0 \; 200] \text{ Ft·lbs ABOUT A}$