1. $\Sigma \vec{\tau} = \vec{\tau}_1 + \vec{\tau}_2$

$= -17.5 + 17.36$

$= -0.14 \text{ N·m}$

$= 0.14 \text{ Nm [CW]}$

$\vec{\tau}_1 = -(35)(0.5)$

$= -17.5 \text{ N·m}$

$\vec{\tau}_2 = (62)(0.28)$

$= 17.36 \text{ N·m}$

2. $\Sigma \vec{\tau} = \vec{\tau}_1 + \vec{\tau}_2$

$= -4.05 + 3.38$

$= -0.67 \text{ N·m}$

$= 0.67 \text{ N·m [CW]}$

$\vec{\tau}_1 = -(4.5)(0.9)$

$= -4.05 \text{ N·m}$

$\vec{\tau}_2 = (1.3)(0.9 + 1.7)$

$= 3.38 \text{ N·m}$

3. $\Sigma \vec{\tau} = \vec{\tau}_1 + \vec{\tau}_2$

$= -454.7 + 315$

$= -139.7 \text{ N·m}$

$= 1.4 \times 10^2 \text{ N·m [CW]}$

$\vec{\tau}_1 = -(175)(\sin 60°)(3)$

$= -454.7 \text{ N·m}$

$\vec{\tau}_2 = (210)(\sin 30°)(3)$

$= 315 \text{ N·m}$

4. a) $\sum \vec{\tau} = 0$

$= \vec{\tau}_1 + \vec{\tau}_2$

$\vec{\tau}_1 = \vec{F}_g \cdot 0.4$

$= -(175)(9.8)(0.4)$

$= -686 \text{ N·m}$

$\vec{\tau}_2 = \vec{F}(2.3)$

$0 = -686 + 2.3\vec{F}$

$686 = 2.3\vec{F}$

$\vec{F} = 298 \text{ N [up]}$

b) $\sum \vec{\tau} = 0$

$= \vec{\tau}_1 + \vec{\tau}_2$

$\vec{\tau}_1 = (50)(9.8)(0.8)$

$= +392 \text{ N·m}$

$\vec{\tau}_2$ — $-\vec{F}(1.2 - 0.8) = -0.4\vec{F}$

$0 = 392 - 0.4\vec{F}$

$\vec{F} = 980 \text{ N [down]}$

@ 0.4 m from Δ

$-\vec{F}(1.2 + 0.8) = -2.0\vec{F}$

$0 = 392 - 2.0\vec{F}$

$\vec{F} = \frac{392}{2}$

$= 196 \text{ N [up]}$