

3-D Couples 2

4-94.

Express the moment of the couple acting on the rod in Cartesian vector form. What is the magnitude of the couple moment?

$$A(0,0,1); B(3,2,-1)$$

* POSITION VECTOR

$$\vec{r}_{AB} = (3, 2, -2) \text{ m}$$

* COUPLE

$$\vec{C} = \vec{r}_{AB} \times \vec{F}_2 = (3, 2, -2) \times (-4, 3, -4)$$

$$\vec{C} = [-2 \ 20 \ 17] \text{ kN}\cdot\text{m}$$

* MAGNITUDE OF COUPLE

$$|\vec{C}| = \sqrt{-2^2 + 20^2 + 17^2}$$

$$C = 26.3 \text{ kN}\cdot\text{m}$$

