



Three force \vec{F}_1 , \vec{F}_2 , and \vec{F}_3 , with magnitudes F_1 , F_2 , and F_3 respectively, act on a wooden block as shown above. Replace the three forces with an equivalent force and couple moment acting on O .

$$\vec{F}_R = -F_3\hat{i} - F_1\hat{j} - F_2\hat{k}$$

$$M_x = d_3 \cdot F_1 + d_1 \cdot F_2$$

$$M_y = -d_4 \cdot F_2 - d_3 \cdot F_3$$

$$M_z = -d_1 \cdot F_3$$

$$\overrightarrow{M_O} = M_x \hat{i} + M_y \hat{j} + M_z \hat{k}$$