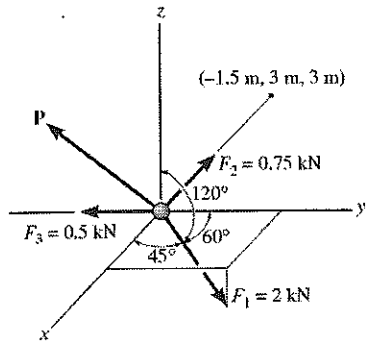
NAME

DATE

PROBLEM AP-13

GIVEN:

Determine the magnitude and direction of the force **P** required to keep the concurrent force system in equilibrium.



REQUIRED: $P = ?$

$\theta_x, \theta_y, \theta_z$

SOLUTION:

$\vec{F_1}, \vec{F_2}, \vec{F_3}$

$\vec{P} = P_x \hat{i} + P_y \hat{j} + P_z \hat{k}$

$\Sigma \vec{F} = 0 : \vec{F_1} + \vec{F_2} + \vec{F_3} + \vec{P} = 0$

$(P_x + 1.41 - 0.25)\hat{i} + (P_y + 1.0 + 0.5 - 0.5)\hat{j}$

$+ (P_z - 1.0 + 0.5)\hat{k} = 0$

$P_x = -1.16^{N} \quad P_y = -1.0^{N} \quad P_z = 0.5^{N}$

$P = \sqrt{P_x^2 + P_y^2 + P_z^2} = 1.61^{KN}$

$\theta_x = \cos^{-1}\left(\frac{-1.16}{1.61}\right) = 136° \quad \theta_y = 128° \quad \theta_z = 72°$

$P = 1.61^{KN}$
$\theta_x = 136°$
$\theta_y = 128°$
$\theta_z = 72°$