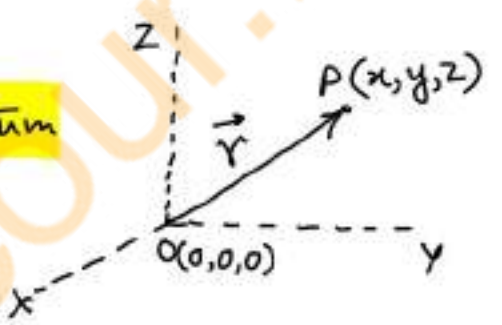
$$|\vec{L}| = \sqrt{2^2+(-12)^2+(-8)^2}$$
$$= \sqrt{4+144+64}$$
$$= \sqrt{212}\ kgm^2/s$$

Rectangular components of Angular Momentum



Let $\vec{r} = x\hat{i} + y\hat{j} + z\hat{k}$

$\vec{p} = p_x\hat{i} + p_y\hat{j} + p_z\hat{k}$

$$\vec{L} = \vec{r}\times\vec{p} = \begin{vmatrix} (+)\hat{i} & (-)\hat{j} & (+)\hat{k} \\ x & y & z \\ p_x & p_y & p_z \end{vmatrix} = \hat{i}(yp_z - zp_y) - \hat{j}(xp_z - zp_x) + \hat{k}(xp_y - yp_x)$$

$$L_x\hat{i} + L_y\hat{j} + L_z\hat{k} = \hat{i}(yp_z - zp_y) + \hat{j}(zp_x - xp_z) + \hat{k}(xp_y - yp_x)$$

comparing the components of both sides

$$L_x = yp_z - zp_y)$$
$$L_y = zp_x - xp_z)$$
$$L_z = xp_y - yp_x$$

} Rectangular components of Angular Momentum.