9.13

$\vec{\omega}_{\text {OB }}=2 \overrightarrow{\mathrm{~J}} \mathrm{rad} / \mathrm{R} \quad \vec{\Omega}=? \quad \vec{N}_{A}=?$
Let $\angle A O B=\gamma$.

$$
\begin{aligned}
& 7^{2}=5^{2}+6^{2}-2(5)(6) \cos \gamma, \gamma=78.463041^{\circ} \\
& \overrightarrow{O A} \cdot \overrightarrow{O B}=5(6) \cos \gamma \\
& \overrightarrow{O A}=\overline{5}(\sin \phi \vec{J}+\cos \phi \vec{K}) \\
& \overrightarrow{O B}=6\left(\cos 60^{\circ} \vec{I}+\sin 60^{\circ} \vec{K}\right) \\
& 30 \sin 60^{\circ} \cos \phi=5(6) \operatorname{cR} \gamma \\
& \therefore \phi=
\end{aligned}
$$

Let $O x y z$ beenbedded in the plate $O A B$ as shown.
9.15 P. 857

$$
\begin{array}{ll}
\omega_{D / M}=2 \mathrm{rad} / \mathrm{h} & \alpha_{D / M}=3 \mathrm{rad} / \mathrm{h}^{2} \\
\omega_{M / B}=1.5 \mathrm{rad} / 2 \quad \alpha_{M / B}=2.5 \mathrm{rad} / \mathrm{h}^{2}
\end{array}
$$

See Five. P19.15

$$
\omega_{B}=4 \mathrm{rad} / \mathrm{h} \quad \alpha_{B}=5 \mathrm{sad} / \mathrm{h}^{2}
$$

$$
\vec{\omega}_{D}=? \quad \vec{\alpha}_{D}=?
$$

$$
\begin{aligned}
\vec{\omega} & =\vec{\omega}_{D}=\vec{\omega}_{D / M}+\vec{\omega}_{M / B}+\vec{\omega}_{B}=\cdots \vec{\omega}^{2} \\
\vec{\alpha} & =\vec{\alpha}_{D}=\vec{\alpha}_{D / M}+\vec{\alpha}_{M / B}+\vec{\alpha}_{B}+\vec{\omega}_{M} \times \vec{\omega}_{D M}+\vec{\omega}_{B} \times \vec{\omega}_{M / B} \\
& =\cdots \cdot \vec{\alpha}_{D}=\overrightarrow{ }
\end{aligned}
$$

$$
\begin{aligned}
& \vec{v}_{B}=\vec{v}_{B / 0 \times y_{z}}+\vec{v}_{B}=\vec{O}+\vec{\Omega} \times \overrightarrow{O B}=\left(\Omega_{\times} \vec{I}+\Omega_{Y} \vec{J}+\Omega_{z} \vec{K}\right) \times 6\left(\cos 60^{\circ} \vec{I}+\sin 60^{\circ} \cdot \vec{K}\right) \\
& \vec{V}_{B}=2 \vec{J} \times 6\left(\cos 60^{\circ} \vec{I}+\sin 60^{\circ} \vec{K}\right) \\
& \left.\begin{array}{l}
\vec{I}: \ldots \ldots . . \\
\overrightarrow{\vec{J}}: \ldots . . . \\
\vec{k}: \ldots . . .
\end{array}\right\} \\
& \Omega_{x}=\frac{\Omega_{z}}{\sqrt{3}}, \quad \Omega_{y}=2 \\
& \text { note that } \vec{v}_{A} \cdot \vec{I}=0 \text { : } \\
& \vec{v}_{A}=\vec{\Omega} \times \overrightarrow{O A} \quad \therefore \Omega_{z}=\Omega_{y} \cot \phi=\square \\
& \vec{\Omega}=\square \quad \overrightarrow{v_{A}}=\square
\end{aligned}
$$

