$$\vec{a}(t) = (V_y \sin(50t), -V_x \sin(50t), 0)$$

$$\Downarrow$$

$$\vec{r}''(t) = (r_y' \sin(50t), -r_x' \sin(50t), 0)$$

$$\begin{cases} r_x''(t) = r_y' \sin(50t) & r_x(0) = 1 \quad r_x'(0) = 0 \\ r_y''(t) = -r_x' \sin(50t) & r_y(0) = 0 \quad r_y'(0) = 1 \\ r_z''(t) = 0 & r_z(0) = 0 \quad r_z'(0) = 0 \end{cases}$$

$z_1 = r_x \quad z_4 = r_x'$
$z_2 = r_y \quad z_5 = r_y'$
$z_3 = r_z \quad z_6 = r_z'$

$$\begin{cases} z_1' = z_4 & z_1(0) = 1 \\ z_2' = z_5 & z_2(0) = 0 \\ z_3' = z_6 & z_3(0) = 0 \\ z_4' = z_5 \sin(50t) & z_4(0) = 0 \\ z_5' = -z_4 \sin(50t) & z_5(0) = 1 \\ z_6' = 0 & z_6(0) = 0 \end{cases}$$