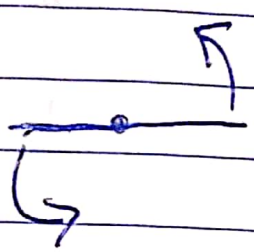
Date

20-P-KM-BK-026



$r = 0.5m$

given: $\dot{r}$, rpm, g

$\dot{\theta} = rpm \cdot \frac{2\pi}{60}$

A.) $a = -r\dot{\theta}^2 u_r + 2\dot{r}\dot{\theta} u_\theta + g u_z$

$$\|a\| = \sqrt{(r\dot{\theta}^2)^2 + (2\dot{r}\dot{\theta})^2 + (g)^2}$$

B.) added $\ddot{\theta}$

$$a = -r\dot{\theta}^2 u_r + (2\dot{r}\dot{\theta} + r\ddot{\theta}) u_\theta + g u_z$$

$$\|a\| = \sqrt{(r\dot{\theta}^2)^2 + (2\dot{r}\dot{\theta} + r\ddot{\theta})^2 + (g)^2}$$

C.) added $\ddot{r}$

$$a = (\ddot{r} - r\dot{\theta}^2) u_r + (2\dot{r}\dot{\theta} + r\ddot{\theta}) u_\theta + g u_z$$

$$\|a\| = \sqrt{(\ddot{r} - r\dot{\theta}^2)^2 + (2\dot{r}\dot{\theta} + r\ddot{\theta})^2 + (g)^2}$$