

第九章：转动 (2005年 - 2016年)

① $I\alpha = Fr\sin\theta$

水平方向

$0.3\alpha = 12 \times 0.3 \times \sin 120 + 6 \times 0.25 \times \sin 90$

$s = vt$

$\alpha = 15.4 \text{ rads}^{-2}$

$= 6.26 \cos 30 \times 1.47$

B

$= 7.97 \text{ m/s}$

作答题:

① (a) $mgh = \frac{1}{2}I\omega^2 + \frac{1}{2}mv^2$

$mgh = \frac{1}{2}(\frac{1}{2}Mr^2)\omega^2 + \frac{1}{2}Mv^2$

$g(L\sin\theta) = \frac{1}{4}r^2\omega^2 + \frac{1}{2}(r\omega)^2$

$g(L\sin\theta) = \frac{3}{4}r^2\omega^2$

$\omega = \sqrt{\frac{4g(L\sin\theta)}{3r^2}}$

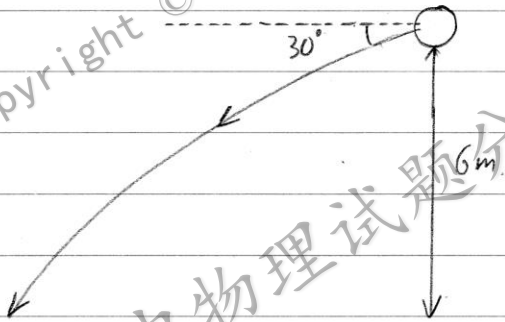
$= \sqrt{\frac{4 \times 9.8 \times 6 \sin 30}{3 \times (0.1)^2}}$

$= 62.6 \text{ rads}^{-1}$

(b) $v = r\omega$

$= 0.1 \times 62.6$

$= 6.26 \text{ ms}^{-1}$



竖直方向

$u = 6.26 \sin 30^\circ$

$t = ?$

$s = -6$

$a = -9.8$

$s = ut + \frac{1}{2}at^2$

$-6 = 6.26 \sin 30 t + \frac{1}{2} \times -9.8 \times t^2$

$-6 = 3.13t - 4.9t^2$

$0 = 4.9t^2 - 3.13t - 6$

$t = 1.47 \text{ s}$