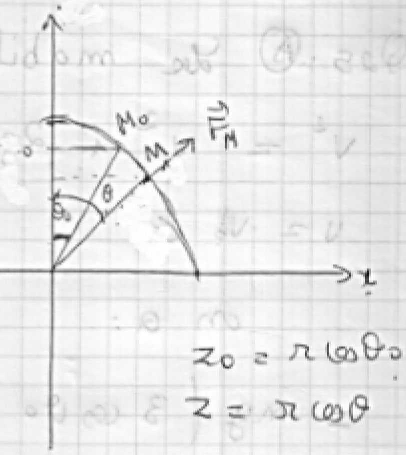
Q 23 (C)



$W(\vec{F}_M)$?

$\Delta E_c = W(\vec{P}) + W(\vec{F}_M)$

$W_{M \to M_0}(\vec{F}_M) = 0$

$\vec{MM_0}$، لها مماس $\perp \vec{F}_M$

$z_0 = r\cos\theta_0$

$z = r\cos\theta$

$h = z_0 - z$

$= r\cos\theta_0 - r\cos\theta$

$h = r(\cos\theta_0 - \cos\theta)$

$W(\vec{P}) = mg\,h$

$= mgr(\cos\theta_0 - \cos\theta)$

$\frac{1}{2}mv^2 - \frac{1}{2}mv_0^2 = mgr(\cos\theta_0 - \cos\theta)$

$v^2 = v_0^2 + 2gr(\cos\theta_0 - \cos\theta)$

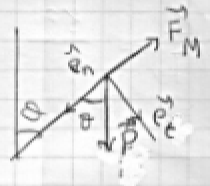
$v = \sqrt{v_0^2 + 2gr(\cos\theta_0 - \cos\theta)}$

Q 24 (D)

ق . II . ن

$\vec{F}_M + \vec{P} = m\vec{a}$

الاسقاط على $(M, \vec{e}_n)$



$-F_M + mg\cos\theta = m\frac{v^2}{r}$

$F_M = mg\cos\theta - \frac{mv^2}{r}$

$= mg\cos\theta - m\frac{v_0^2}{r} - 2mg(\cos\theta_0 - \cos\theta)$

$= 3mg\cos\theta - 2mg\cos\theta_0 - \frac{mv_0^2}{r}$

$F_M = mg(3\cos\theta - 2\cos\theta_0) - \frac{mv_0^2}{r}$.

Q25 : (A) Le mobile quitte la sphère en $\theta_0 = \theta$

$$v^2 = v_0^2 + 2gr(\cos\theta_0 - \cos\theta_0)$$

$$v = v_0 \Leftarrow$$

on a : $F_M = 0$

$$F_M = mg(3\cos\theta_0 - 2\cos\theta_0) - \frac{mv_0^2}{r} = 0$$

$$mg\cos\theta_0 = \frac{mv^2}{r}$$

$$v^2 = gr\cos\theta_0$$

$$v = \sqrt{gr\cos\theta_0}$$

بالتوفيق