

O2on ATLAN

120060 3805

$$1) r = \frac{0,2}{\cos \theta}$$

$$\dot{r} = \frac{dr}{dt} = \frac{0,2 \sin \theta \cdot \dot{\theta}}{\cos^2 \theta} = \frac{2,4 \sin \theta}{\cos^2 \theta}$$

$$\begin{aligned} \ddot{r} = \frac{d\dot{r}}{dt} &= \frac{2,4 \cos^3 \theta \cdot \ddot{\theta} + \sin^2 \theta \cdot 2 \cdot \cos \theta \cdot \dot{\theta}}{\cos^4 \theta} \\ &= \frac{2,4 \theta (\cos^2 \theta + 2 \sin^2 \theta)}{\cos^3 \theta} \end{aligned}$$

$$a) R_{\theta} = P - Q \sin \theta = 2m \left( \frac{2,4 \sin \theta}{\cos^2 \theta} \right)$$

$$= 57,6 \frac{\sin \theta}{\cos^2 \theta} \text{ m}$$

$$R_r = m \cdot \frac{28,8}{\cos \theta} [1 + 2 \tan^2 \theta - 1]$$

$$\frac{28,8m}{\cos \theta} (2 \tan^2 \theta)$$

$$= 57,6m \frac{\sin^2 \theta}{\cos^2 \theta}$$

$$b) R_{\theta} = P - Q \sin \theta$$

$$P = R_{\theta} \cdot \cos \theta$$

$$= \frac{57,6m \sin \theta}{\cos^2 \theta} + \frac{57,6m \sin^3 \theta}{\cos^4 \theta} = \frac{57,6m \sin \theta}{\cos^4 \theta}$$

$$R_r = Q \cos \theta$$

$$Q = \frac{R_r}{\cos \theta} = \frac{57,6m \sin^2 \theta}{\cos^4 \theta}$$

$$2) x = 60 \text{ mm}$$

$$x = \frac{y^2}{6}$$

$$x = 60 \text{ in}$$

$$y^2 = 360$$

$$y = 18.97 \text{ mm}$$

$$\frac{\dot{x} = 2 \cdot y \dot{y}}{6} \Rightarrow \dot{x} = \frac{y \cdot \dot{y}}{3} \Rightarrow \dot{x} = \frac{18.97 \times 30}{3}$$

$$\dot{x} = 189.7 \text{ mm/s}$$

$$\ddot{y} = 0 \Rightarrow \dot{x} = \frac{y \dot{y}}{3} \Rightarrow \ddot{x} = \frac{1}{3} (\dot{y} \cdot \dot{y} + y \cdot \ddot{y})$$

$$\ddot{x} = \frac{1}{3} (30 \times 30 + 0) = \ddot{x} = 300 \text{ mm/s}^2$$

$$v = \sqrt{\dot{x}^2 + \dot{y}^2}$$

$$v = \sqrt{189.7^2 + 30^2}$$

$$\underline{v = 192.057 \text{ /s}}$$

$$a = \sqrt{\ddot{x}^2 + \ddot{y}^2}$$

$$a = \sqrt{300^2 + 0^2}$$

$$\underline{a = 300 \text{ mm/s}^2}$$