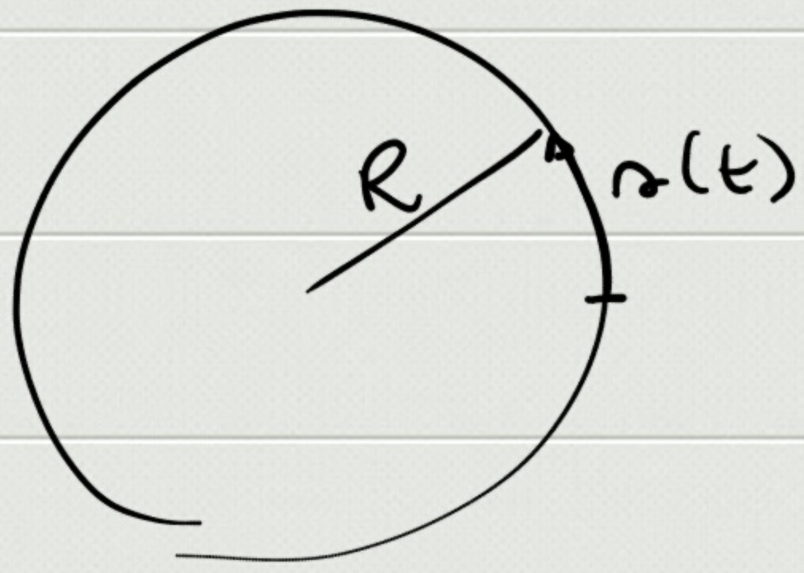


$$r(t) = t^3 + 2t^2$$

$$|\tilde{a}(t_1)| = a_1 = 16\sqrt{2}\ m/s^2$$

$$t_1 = 2\ s$$

$R = ?$

$$|\bar{a}(t_1)| = \sqrt{a_\tau^2(t_1) + a_N^2(t_1)}$$

⇑

- ~~$a_\tau(t) = \text{const}$~~

- ~~$a_\tau(t) = 3t^2 + 4t$~~ ⇐ $v(t)$

- ~~$a_\tau(t) = 0$~~

- $a_\tau(t) = 6t + 4$ *

$$r(t) = t^3 + 2t^2$$

$$v(t) = \frac{dr}{dt} = 3t^2 + 4t \Leftarrow$$

$$\left[a_\tau(t) = \frac{dv}{dt} = 6t + 4 \right.$$

$$a_N = \frac{v^2}{R} \Rightarrow \left[a_N(t) = \frac{v^2(t)}{R} = \frac{(3t^2+4t)^2}{R} \right.$$

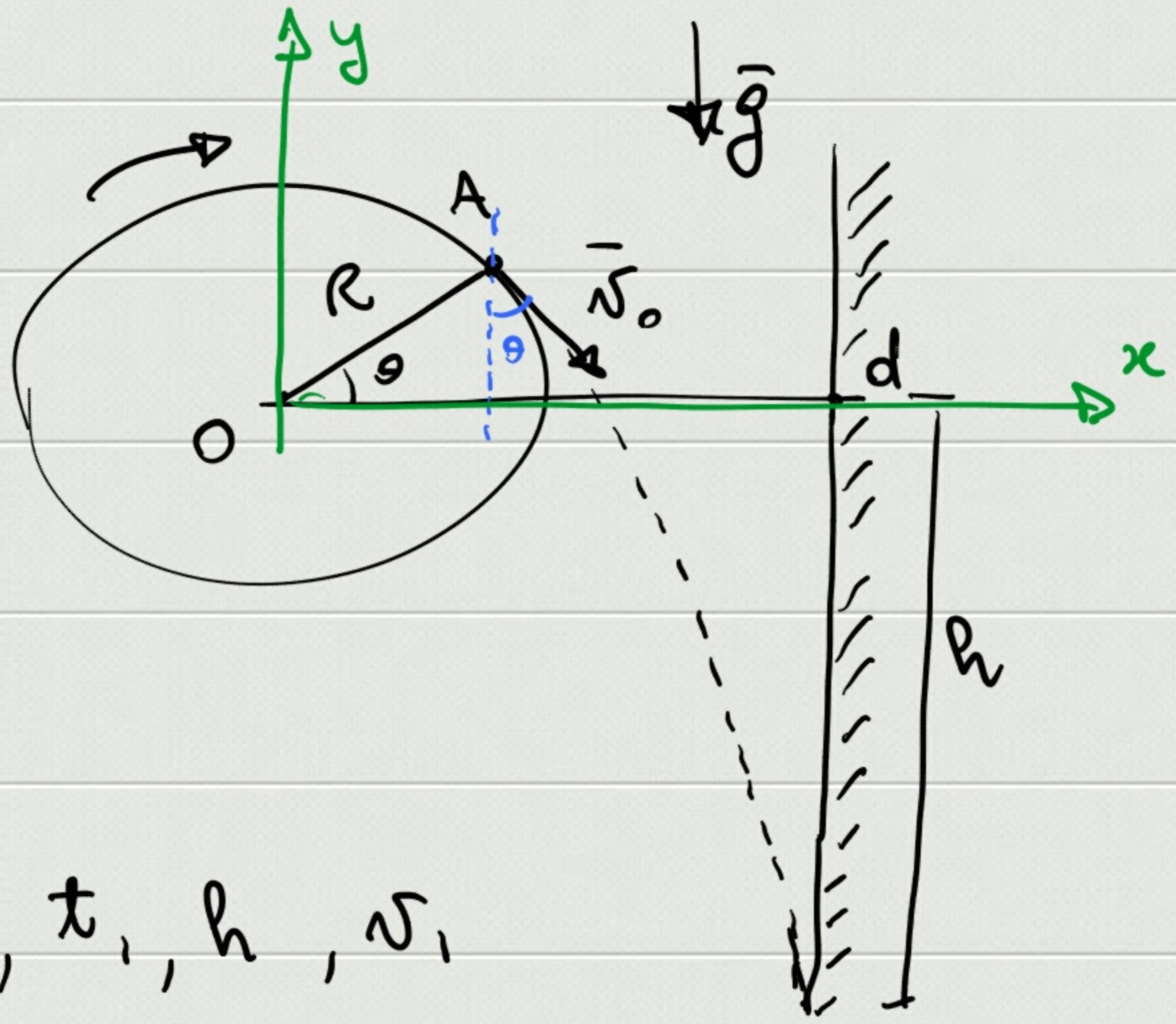
⇑

$$a^2(t_1) = a_1^2 = a_T^2(t_1) + a_N^2(t_1)$$

$$a_N^2(t_1) = a_1^2 - a_T^2(t_1)$$

$$\frac{(3t_1^2 + 4t_1)^4}{R^2} = a_1^2 - (6t_1 + 4)^2$$

$$\Rightarrow R = \frac{(3t_1^2 + 4t_1)^2}{\sqrt{a_1^2 - (6t_1 + 4)^2}} = 25 \text{ m}$$



$R = 0.4\ m$

$f = 1\ giro/s$

$\vartheta = \pi/6$

$d = 0.8\ m$

$\bar{v}_0, t_1, h, v_1$

$$f = \frac{1}{T} \qquad v_0 = \frac{2\pi R}{T} = 2\pi R f = 2.52\ m/s$$

$$v_{0x} = v_0 \sin\vartheta \qquad v_{0y} = -v_0 \cos\vartheta$$

$$\bar{r}(t) = \bar{r}_0 + \bar{v}_0 t + \frac{1}{2}\bar{a}\, t^2$$

$$- \ x(t) = R\cos\vartheta + v_0 \sin\vartheta \cdot t \qquad *$$

$$- \ x(t) = R\sin\vartheta - v_0 \cos\vartheta \cdot t$$

$$- \ x(t) = R\cos\vartheta + v_0 \sin\vartheta \cdot t - \frac{1}{2} g t^2$$

$$- \ x(t) = R\sin\vartheta + v_0 \cos\vartheta \cdot t - \frac{1}{2} g t^2$$

$$d = x(t_1) \Rightarrow \quad t_1 = \frac{d - R\cos\vartheta}{v_0 \sin\vartheta} = 0.36\ s$$

$$y(t) = y_0 + v_{0y} t - \frac{1}{2} g t^2 =$$

$$= R \sin\theta - v_0 \cos\theta \cdot t - \frac{1}{2} g t^2$$

$$-h = R \sin\theta - v_0 \cos\theta \cdot t_1 - \frac{1}{2} g t_1^2$$

$$\Rightarrow h = 1.22 \text{ m}$$

$$\vec{v}(t) = \vec{v}_0 + \vec{a} t = \vec{v}_0 - \vec{g} t$$

$$\begin{cases} v_{1x} = v_x(t_1) = v_{0x} = v_0 \sin\theta = 1.26 \text{ m/s} \\ v_{1y} = v_y(t_1) = v_{0y} - g t_1 = -v_0 \cos\theta - g t_1 = \\ \qquad = -5.71 \text{ m/s} \end{cases}$$

$$v_1 = |\vec{v}_1| = \sqrt{v_{1x}^2 + v_{1y}^2} = 5.8 \text{ m/s}$$