

$$\bar{r}(t) = (t, \cos t, \cos 2t)$$

1

$$\bar{v}(t) = (1, -\sin t, -2 \sin 2t)$$

not $t-e$ r'')
-1? r'

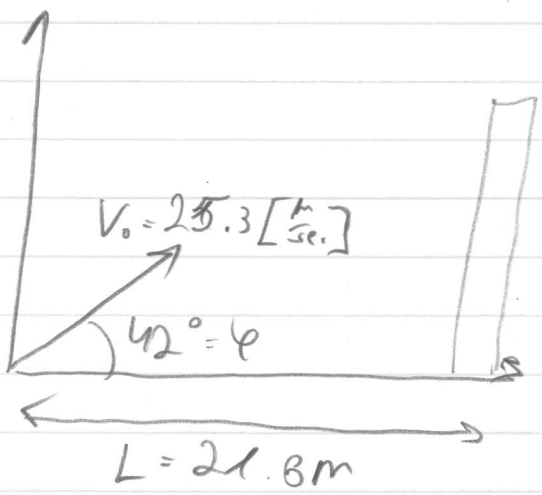
$$\bar{a}(t) = (0, -\cos t, -4 \cos 2t)$$

$$\bar{v}(0) = (1, 0, 0)$$

$$\bar{v}(\pi) = (1, 0, 0)$$

$$\bar{a}(0) = (0, -1, -4)$$

$$\bar{a}(\pi) = (0, 1, -4)$$



$$x(t) = 0 + V_0 \cos \phi \cdot t$$

$$y(t) = 0 + V_0 \sin \phi \cdot t - \frac{g}{2} t^2 \quad g = 10 \left[\frac{m}{s^2} \right]$$

$$x(t) = L \quad (1) \quad 10$$

$$V_0 \cos \phi \cdot t = L$$

$$t_{imp} = \frac{L}{V_0 \cos \phi} = 1.16 \text{ [sec]}$$

$$y_{imp}(t_{imp}) \quad \text{resp} \quad ?$$

$$y_{imp} = V_0 \sin \phi \cdot t_{imp} - \frac{g}{2} t_{imp}^2 = 12.9 \text{ [m]}$$

$$\vec{V}(t) = \frac{d}{dt} (x(t), y(t)) = \quad d$$

$$(V_0 \cos \phi, V_0 \sin \phi - gt)$$

$$\vec{V}_{imp} = (18.8, 5.32) \frac{m}{sec}$$

100) $V_y > 0$ \rightarrow 110) 3



$$\vec{r}(t) = t^2 \hat{x} - 3t \hat{y} + (2 + 3t - 4.9t^2) \hat{z} \quad 3$$

$$\vec{v}(t) = \dot{\vec{r}}(t) = 2t \hat{x} - 3 \hat{y} + (3 - 9.8t) \hat{z} \quad 10$$

$$\vec{v}(t=0) = (0, -3, 3) \left[\frac{m}{s} \right]$$

$$\vec{a}(t) = \dot{\vec{v}}(t) = 2 \hat{x} - 9.8 \hat{z} \quad 10$$

$$\|\vec{a}(t)\| = \sqrt{2^2 + (9.8)^2} \approx 10 \left[\frac{m}{s^2} \right] = \text{const}$$

$$\|\vec{v}(t)\| = \sqrt{(2t)^2 + 9 + (3 - 9.8t)^2}$$

$$\|\vec{v}(0)\| = \sqrt{9 + 9} = \sqrt{18}$$