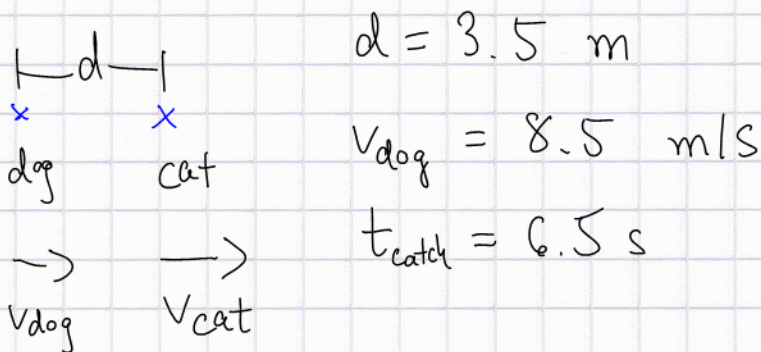


# Tutorial Sept 25

①

2.58



$$x_{\text{dog}} = v_{\text{dog}} t$$

$$x_{\text{cat}} = v_{\text{cat}} t + d$$

$$\left. \begin{array}{l} x_{\text{dog}}(t_{\text{catch}}) = x_{\text{cat}}(t_{\text{catch}}) \\ v_{\text{dog}} t_{\text{catch}} = v_{\text{cat}} t_{\text{catch}} + d \end{array} \right\}$$

$$\Leftrightarrow v_{\text{cat}} = v_{\text{dog}} - \frac{d}{t_{\text{catch}}}$$

$$= \left( 8.5 - \frac{3.5}{6.5} \right)$$

$$= 8.0 \text{ m/s}$$

3.12

$$v_0 = 50 \text{ m/s}$$

$$v_f = 35 \text{ m/s}$$

a)  $d = x_f - x_0 = 35 \text{ m}$

$$\text{use } x_f - x_0 = \frac{v_f^2 - v_0^2}{2a} \quad \Leftrightarrow \quad a = \frac{v_f^2 - v_0^2}{2d}$$

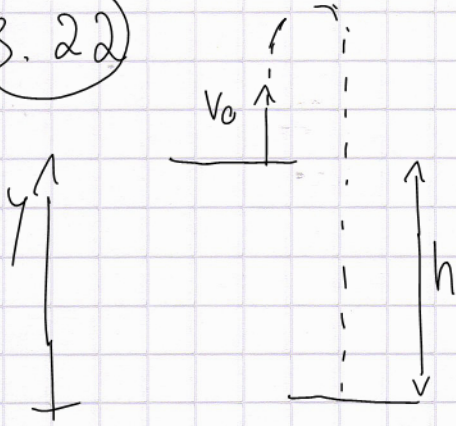
$$= \frac{35^2 - 50^2}{70}$$

b)  $m = 0.11 \text{ kg}$

Newton-2.  $F = ma = -2.0 \text{ N}$

$$= -18 \frac{\text{m}}{\text{s}^2}$$

3.22

relations.

$$a_y = -g$$

$$v_y = v_0 - gt$$

$$y = h + v_0 t - \frac{g}{2} t^2$$

$$v_y^2 = v_0^2 - 2g(y-h)$$

a)  $v_y^2 (y=h) = v_0^2 \rightarrow \text{speed } |v_y| = v_0$

b)  $v_y^2 (y=0) = v_0^2 + 2gh \rightarrow \text{speed } |v_y| = \sqrt{v_0^2 + 2gh}$

c) same as in b).