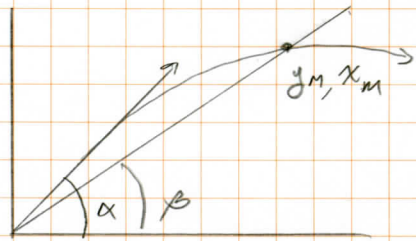


TM5 Pr 2.3

TM 5 2-3 FOR A PROJECTILE FIRED AT v_0 AND α , SHOW ITS PATH INTERSECTS A LINE AT AN ANGLE β AT

$$t_0 = \frac{2v_0}{g} (\sin \alpha - \cos \alpha \tan \beta)$$



$$\frac{y_{\text{MEET}}}{x_{\text{MEET}}} = \tan \beta$$

FIND $y(x)$

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

$$x = x_0 + v_{0x} t$$

$$\Rightarrow t = \frac{x}{v_{0x}} = \frac{x}{v_0 \cos \alpha}$$

SINCE $x_m = \frac{y_m}{\tan \beta}$

$$t = \frac{y}{v_0 \cos \alpha \tan \beta}$$

USING THE KINEMATIC EQUATION FOR y

$$y = \frac{v_0 \sin \alpha x}{v_0 \cos \alpha \tan \beta} - \frac{1}{2} g t^2$$

$$v_0 \cos \alpha \tan \beta = v_0 \sin \alpha - \frac{1}{2} g t$$

$$t = \frac{2v_0}{g} (\sin \alpha - \cos \alpha \tan \beta)$$