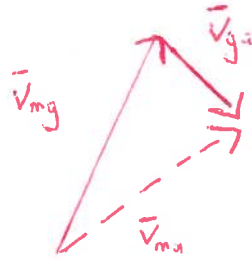


①



$$\frac{270}{58} \\ \hline 328$$



$$\vec{V}_{mg} = 322 \cos 58 + 322 \sin 58$$

$$\vec{V}_{ga} = 83 \cos 328 + 83 \sin 328$$

$$\vec{V}_{ma} = \vec{V}_{mg} + \vec{V}_{ga}$$

$$V_{max} = 322 \cos 58 + 83 \cos 328$$

$$V_{max} = 170.6340 + 70.38799$$

$$V_{max} = 241.022$$

$$V_{may} = 322 \sin 58 + 83 \sin 328$$

$$V_{may} = 271.137539 + (-43.9832)$$

$$V_{may} = 227.154339$$

$$V_{may} = 229.088$$

$$V_{ma} = \left( (V_{max})^2 + (V_{may})^2 \right)^{1/2} = 332.525$$

$$\theta = \tan^{-1} \left( \frac{229.088}{241.022} \right) = 43.545$$

$$\vec{V}_{ma} = \cancel{332} 333 \text{ km/h} \begin{bmatrix} N 46^\circ E \\ E 44^\circ N \end{bmatrix} = 3.3 \times 10^2 \text{ km/h} \begin{bmatrix} E 44^\circ N \end{bmatrix}$$

②



$$|\vec{v}| = 18 \text{ m/s}$$

$$v_x = 14.3754$$

$$v_y = 10.8326$$

$d_x = v_x t$   
 ↓  
 Need to solve for  
 $t$   
 ↓  
 use  $y = 0$

$$y = 2.1 + 10.83t - 4.9t^2$$

$$0 = t^2 - 2.21t - 0.42$$

$$t = \frac{2.21 \pm \sqrt{4.88 + 1.712}}{2}$$

$$t = \frac{2.21 + 2.568}{2} \quad (\text{ignore } (-))$$

$$t = 2.3888$$

$$d_x = 14.3754 \times 2.3888$$

$$d_x = 34.3$$

Ball lands 34 m

max height  $v_y = 0$ 

$$v = v_y - 9.8t$$

$$9.8t = 10.83$$

$$t = 1.105 \text{ s}$$

$$y = 2.1 + 10.83(1.10) - 4.9(1.10)^2$$

$$y = 14.074 - 5.987078$$

$$y = 8.087$$

$$y = \underline{8.1 \text{ m}}$$

Maximum height 8.1 m