Quiz#3 Ch4-1

Name: Solution ID#: Sec#:

A ball is projected from the ground to the air with velocity$ \vec{v}\_{0}$. At height of 10.0 m, the velocity is$ \vec{v}=8.5\hat{i}+9.7\hat{j} ^{m}/\_{s}$ . Find$ \vec{v}\_{0}$.

Since $ a\_{x}=0, then v\_{x}=v\_{0x}=constant$

Given $v\_{x}=v\_{0x}=8.5 m/s$

 $v\_{y}=9.7 m/s$

We need to find $v\_{0y}$ assuming the acceleration is constant i.e.

 $a\_{y}=-g=-9.8 ^{m}/\_{s^{2}}$

(We assume the positive direction is up and y=0 is at the ground)

Using $v\_{y}^{2}=v\_{0y}^{2}+2a\_{y}(y-y\_{0})$

 $(9.7)^{2}=v\_{0y}^{2}-2×9.8×\left(10-0\right) ⇒ v\_{0y}=17 ^{m}/\_{s}$

 $⇒ \vec{v}\_{0}=8.5\hat{i}+17\hat{j} ^{m}/\_{s}$