

$$\begin{aligned}\text{constant horizontal speed} &= 30 \cos 45^\circ \\ &= 15.760 \text{ ms}^{-1}\end{aligned}$$

$$\begin{aligned}\text{initial vertical speed } u &= 30 \sin 45^\circ \\ &= 15.760 \text{ ms}^{-1}\end{aligned}$$

v is vertical speed at $t = 3$ secs.

$$\text{using } v = u + at$$

substituting for $a = -g$

$$\begin{aligned}v &= u - gt \\ &= 15.76 - (9.8 \times 3) \\ &= -13.64\end{aligned}$$

vertical component of speed is -13.64 ms^{-1}