

to find the horizontal velocity you need to find how long the ball was in the air, because you are going to assume that the horizontal velocity is constant the whole time. So once you know how long the ball was in the air you can do: distance/time to get the horizontal velocity

1) use the y velocity to find the time it is in the air:

use equation $V_{\text{final}} = V_{\text{initial}} + \text{acceleration} \times \text{time}$ --- so V_{initial} is 30m/s and acceleration is -9.8m/s^2

we will use 0 for V_{final} , because when it reaches its peak the velocity is equal to 0

$$0 = 30\text{m/s} + (-9.8\text{m/s}^2) \times \text{time}$$

solve for time: $t = -30/(-9.8)$ which is about 3.06 seconds

this is the time to get to the peak, which is half the time it is in the air, so multiply 3.06 seconds by two to get the total time in the air which gives 6.12 seconds

2) use this time to find the horizontal velocity

$$90\text{m}/6.12\text{s} = \text{horizontal velocity}$$

so the horizontal velocity is approximately 14.7 m/s