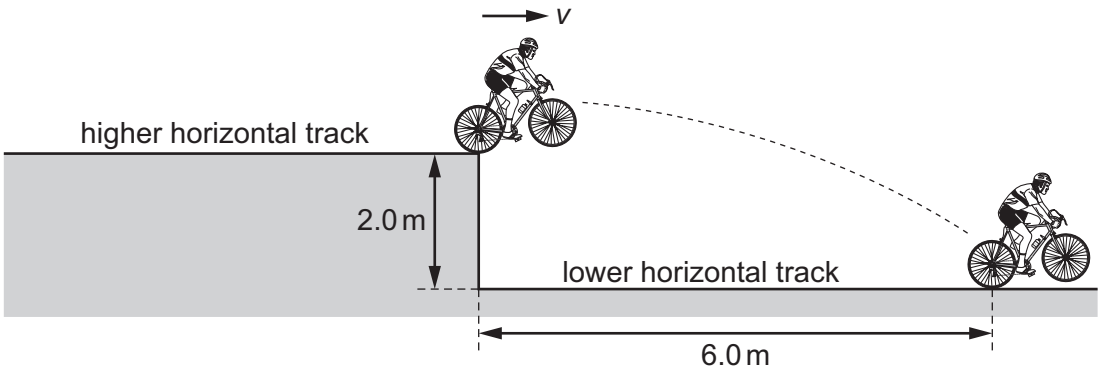
**6** A cyclist pedals along a raised horizontal track. At the end of the track, he travels horizontally into the air and onto a track that is vertically 2.0 m lower.

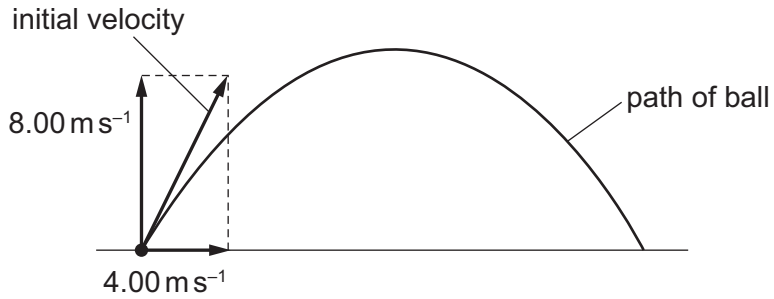



The cyclist travels a horizontal distance of 6.0 m in the air. Air resistance is negligible.

What is the horizontal velocity $v$ of the cyclist at the end of the higher track?

**A** $6.3\,m\,s^{-1}$ **B** $9.4\,m\,s^{-1}$ **C** $9.9\,m\,s^{-1}$ **D** $15\,m\,s^{-1}$

**7** An astronaut on the Moon, where there is no air resistance, throws a ball. The ball's initial velocity has a vertical component of $8.00\,m\,s^{-1}$ and a horizontal component of $4.00\,m\,s^{-1}$, as shown.




The acceleration of free fall on the Moon is $1.62\,m\,s^{-2}$.

What will be the speed of the ball 9.00 s after being thrown?

**A** $6.6\,m\,s^{-1}$ **B** $7.7\,m\,s^{-1}$ **C** $10.6\,m\,s^{-1}$ **D** $14.6\,m\,s^{-1}$