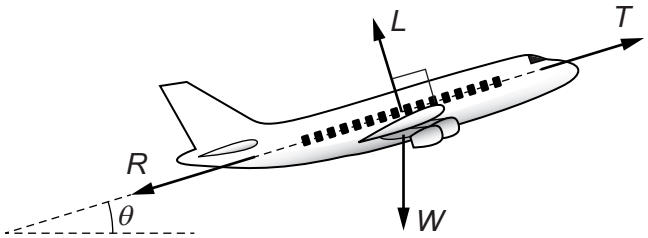
4 An aeroplane is moving at a constant speed in a straight line at an angle θ to the horizontal.

Four forces act on the aeroplane: thrust force T, weight W, lift force L and resistive force R.



Which two equations must be correct?

A $L = W\cos\theta$ and $T = R + W\sin\theta$

B $L = W\sin\theta$ and $T = R + W\cos\theta$

C $L = W\cos\theta$ and $T = R - W\sin\theta$

D $L = W\sin\theta$ and $T = R - W\cos\theta$

5 What is the definition of acceleration?

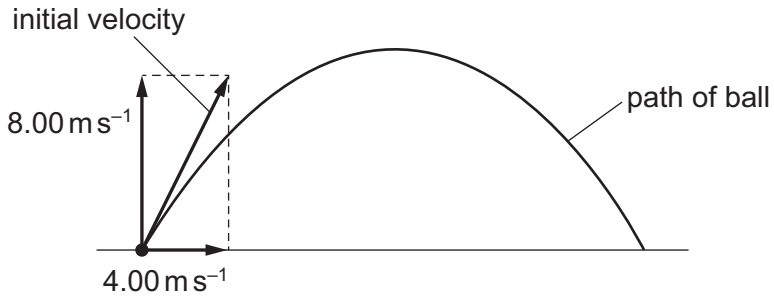
A the rate of change of displacement

B the rate of change of kinetic energy

C the rate of change of momentum

D the rate of change of velocity

6 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 is the speed of the ball 9.00 s after being thrown?

A $6.58\,m\,s^{-1}$ **B** $7.70\,m\,s^{-1}$ **C** $10.6\,m\,s^{-1}$ **D** $14.6\,m\,s^{-1}$