

10 Ramped Questions on calculating acceleration

Acceleration is one of the most important ideas in GCSE Physics because it explains how quickly an object's velocity changes. These questions are based on realistic situations and become progressively more challenging, including rearranging equations and converting units.

1. A child on a scooter leaves a park entrance at 1 m/s and reaches 5 m/s after 4 seconds. Calculate their acceleration.
2. A London bus pulls away from a stop, increasing its velocity from 0 m/s to 10 m/s in 8 seconds. Calculate the acceleration.
3. A cyclist riding along the Thames Path increases their velocity from 4 m/s to 12 m/s in 5 seconds. Calculate the acceleration.
4. A Formula 1 car exits a corner at 20 m/s and reaches 44 m/s after 3 seconds. Calculate the acceleration.
5. A rollercoaster train climbs a launch section and speeds up from 8 m/s to 32 m/s in 6 seconds. Calculate the acceleration.
6. An electric car accelerates at 2.5 m/s^2 from rest for 12 seconds. Calculate its final velocity.
7. A train leaves a station at 5 m/s and accelerates at 1.5 m/s^2 for 20 seconds. Calculate its final velocity.
8. A delivery van travelling at 18 km/h accelerates to 72 km/h in 10 seconds. Calculate its acceleration in m/s^2 .
9. A passenger jet accelerates along a runway from 30 m/s to 90 m/s. If its acceleration is 4 m/s^2 , calculate the time taken to reach take-off speed.
10. A rocket launches vertically from rest and reaches a velocity of 360 m/s after 30 seconds.

a) Calculate the rocket's acceleration.

b) If the rocket continued accelerating at the same rate for a further 20 seconds, calculate its new velocity.