**Acceleration Calculations**

**Use the equation a= (v-u)**

**t**

1. Change in speed = 14 m/s; time taken = 2 seconds. Calculate the acceleration.
2. A car accelerates from rest (zero speed) up to a speed of 30 m/s in 12 seconds. Calculate the acceleration.
3. A cyclist in the Tour de France accelerates down a hill from 22 m/s to a speed of 37 m/s. This acceleration takes him 2 seconds. Calculate the acceleration.
4. A rocket launching in the Ukraine accelerates upwards from rest to a speed of 12 km/s in 8 seconds. Calculate the acceleration.
5. A cyclist accelerates from 0 m/s to 8 m/s in 3 seconds. What is his acceleration? Is this acceleration higher than that of a car which accelerates from 0 to 30 m/s in 8 seconds?
6. A car advertisement states that a certain car can accelerate from rest to 70 km/h in 7 seconds.  Find the car’s average acceleration.
7. A lizard accelerates from 2 m/s to 10 m/s in 4 seconds.  What is the lizard’s average acceleration?
8. If a Ferrari, with an initial velocity of 10 m/s, accelerates at a rate of 50 m/s2 for 3 seconds, what will its final velocity be?

**Use the equation v2 − u2 = 2as to help you answer these questions.**

1. 1. A car begins at a speed of 3m/s and accelerates at 2m/s2 over a distance of 40m, calculate the final speed of the car.
2. 2. A runner reaches a speed of 3m/s after accelerating at 2.25m/s2 whilst travelling a distance of 2m, calculate the initial speed of the runner.
3. 3. A bicycle accelerates from rest to 6m/s in a distance of 50m, calculate the acceleration.
4. 4. A person who is initially stationary is eventually walking at a speed of 1.5m/s after an acceleration of 0.5 m/s2, calculate the distance it takes them to reach this speed.
5. 5. A car reaches a speed of 15m/s after an acceleration of 2m/s2 over a distance of 44m, calculate the initial speed.
6. 6. A motorbike reaches a speed of 20m/s over 60m, whilst accelerating at 3m/s2, determine the bike’s initial speed.
7. 7. A person begins moving after initially being stationary, the person accelerates at 0.5m/s2 over a distance of 9m, what is their final speed?
8. 8. A lorry pulls forward after initially being stationary, it takes the lorry 40m to reach a speed of 8m/s, calculate the lorry’s acceleration.
9. 9. A child travels down a slide, at the top the child is initially at rest, at the bottom the child is travelling at a speed of 3m/s, the child’s acceleration is 1m/s2, how long is the slide?