Corbettmaths

Constant Acceleration Formulae

Mechanics

Video Tutorial

s - displacement (m)
u - initial velocity (m/s)
v - final velocity (m/s)
a - acceleration (m/s^2)
t - time (seconds)

$v = u + at$ $\quad s = \frac{1}{2}(u + v)t$ $\quad v^2 = u^2 + 2as$

$s = ut + \frac{1}{2}at^2$ $\quad s = vt - \frac{1}{2}at^2$

A motorbike starts from rest and travels in a straight line with an acceleration of $2.4m/s^2$ for 8 seconds.

(a) Work out the speed of the motorbike after 8 seconds.
(b) Work out the distance travelled by the motorbike.

A particle is travelling in a straight line.
The particle accelerates from a speed of 4m/s to a speed of 16m/s in 5 seconds.

(a) Work out how far the particle travels during the 5 seconds.
(b) Work out the particle's acceleration.

A car drives along a straight road with constant acceleration of 1.8m/s^2
The car is travelling at 3m/s when it passes a lamppost.
5 seconds later it passes the next lamppost.

(a) Work out the distance between the lampposts.
(b) Work out the speed with which the car passes the second lamppost.

A train is travelling in a straight line towards a platform.
The train passes a signal at 30m/s and it starts decelerating at a rate of $4m/s^2$
The train comes to rest at the platform.

(a) Work out the time taken for the train to reach the platform from the signal.
(b) Work out the distance between the signal and platform.

A particle travels in a straight line, from P to Q, with acceleration of $14.2 m/s^2$
The velocity of the particle at P is 2m/s
The velocity of the particle at Q is 50m/s

Work out the distance PQ.

A lorry is driving along a straight road with constant acceleration of $2 m/s^2$
The lorry passes point A with a speed of 4m/s.
The lorry then passes the point B, which is 45m from A.

How long does it take the lorry to travel from A to B?