1.4 Equations of motion

$V = U + a\,t$
$S = U\,t + \frac{1}{2}\,a\,t^2$
$2\,a\,s = V^2 - U^2$
$S = \frac{1}{2}\,(U + V)\,t$

Whereby:

S is Displacement or Distance
U is Initial Velocity
V is Final Velocity
a is Acceleration
t is Time

Examples:

1. A car accelerates from rest with an acceleration of 4m/s² for 6s Find the Final velocity

Ans:
Initial velocity (U) = 0m/s
Acceleration (a) = 4m/s²
Time (t) = 6s

$V = U + a\,t$
$V = 0 + 4 \times 6$
$V = 24mls$

2. A ball is thrown vertically upward with an initial velocity of 20m/s Calculate the maximum height it reaches if the acceleration due to ches gravity is 9.8 m/s² for 10 seconds.

U = 20m/s
t = 10 sec
a = 9.8m/s²

$S = ut + \frac{1}{2}\,at^2$
$S = 20 \times 10 + \frac{1}{2} \times 9.8 \times 10^2$
$S = 200 + 19.6 \times 100$
$S = 200 + 1960$
$S = 2160m$