## Year 12 Distance, Velocity & Acceleration Problems

1. A ball is kicked vertically upwards. Its height h in metres at t seconds is:	4. If acceleration $a = 6t$
$h = 20t - 5t^2$	a) Find the equation for velocity v given $v = 2$ when $t = 0$
a) Find the velocity equation $v = \frac{dh}{dt}$	b) Find the equation for distance travelled x given $x = 4$ when $t = 0$
b) Find t when $\mathbf{v} = 0$	5. If acceleration $\frac{dv}{dt} = a$
c) Find maximum height of the ball	a) Find the velocity equation given
2. The velocity of a mechanical car	$\mathbf{v} = \mathbf{u}$ at $\mathbf{t} = 0$
$v = \frac{dx}{dt} = 4 + 2t$	b) Find the distance equation given $x = 0$ at $t = 0$
a) Find an equation for the distance travelled at t seconds given that x = 5m at $t = 0$	
b) Find x if $t = 10$ sec	
3. If the acceleration is:	
$a = \frac{dv}{dt} = 4 \text{ m/s}^2$	
a) Find the velocity v given v=3 m/s at t=0.	
b) Find the distance travelled x	
(note $\frac{dx}{dt} = v$ ) given that $x = 2$	
when $t = 0$	

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(note $\frac{dx}{dt} = v$ ) given that $x = 2$ when $t = 0$	