## Year 12 Distance, Velocity \& Acceleration Problems

1. A ball is kicked vertically upwards. Its height $h$ in metres at $t$ seconds is:
$h=20 t-5 t^{2}$
a) Find the velocity equation

$$
\mathrm{v}=\frac{d h}{d t}
$$

b) Find $t$ when $v=0$
c) Find maximum height of the ball
2. The velocity of a mechanical car
is:
$\mathrm{v}=\frac{d x}{d t}=4+2 \mathrm{t}$
a) Find an equation for the distance travelled at t seconds given that $\mathrm{x}=5 \mathrm{~m}$ at $\mathrm{t}=0$
b) Find x if $\mathrm{t}=10 \mathrm{sec}$
3. If the acceleration is:
$\mathrm{a}=\frac{d v}{d t}=4 \mathrm{~m} / \mathrm{s}^{2}$
a) Find the velocity $v$ given $v=3$
$\mathrm{m} / \mathrm{s}$ at $\mathrm{t}=0$.
b) Find the distance travelled x (note $\frac{d x}{d t}=\mathrm{v}$ ) given that $\mathrm{x}=2$ when $\mathrm{t}=0$
4. If acceleration $\mathrm{a}=6 \mathrm{t}$
a) Find the equation for velocity v given $v=2$ when $t=0$
b) Find the equation for distance travelled x given $\mathrm{x}=4$ when $\mathrm{t}=0$
5. If acceleration $\frac{d v}{d t}=\mathrm{a}$
a) Find the velocity equation given $v=u$ at $t=0$
b) Find the distance equation given $x=0$ at $t=0$

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