Calculus 12
7-2 Questions

1. The position functions give the displacement $s$ as a function of the time $t$. Find the velocity and acceleration as functions of $t$.
a) $s=12+30 t$
b) $s=16 t^{2}+5 t-10$
c) $s=t^{3}+5 t^{2}+t+1$
d) $s=\sqrt{t^{2}+t}$
2. The position function of a particle is $s=t^{3}-12 t, t \geq 0$, where $s$ is measured in metres and $t$ is measured in seconds. Find the acceleration at the instant when the velocity is 0 .
3. A particle moves according to the equation of motion $s=t^{3}-9 t^{2}+18 t$, where $t$ is measured in seconds and $s$ in metres.
a) When is the acceleration 0 ?
b) Find the displacement and velocity at that time.
4. The position function of a particle is $s=t^{4}-12 t^{3}+30 t^{2}+5 t, t \geq 0$. When is the acceleration positive and when is it negative?
5. A car is travelling at $72 \mathrm{~km} / \mathrm{h}$ and the brakes are fully applied, producing a constant deceleration of $12 \mathrm{~m} / \mathrm{s}^{2}$.
a) Verify that the velocity function by $v(t)=-12 t+20$, where $t$ is measured in seconds, gives this deceleration and initial velocity.
b) How long does it take for the car to come to a complete stop.
