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 + 30tb) $s = 16t^2 + 5t - 10$ c) $s = t^3 + 5t^2 + t + 1$ d) $s = \sqrt{t^2 + t}$

2. The position function of a particle is $s = t^3 - 12t$, $t \ge 0$, 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 $s = t^3 - 9t^2 + 18t$, 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 $s = t^4 - 12t^3 + 30t^2 + 5t$, $t \ge 0$. When is the acceleration positive and when is it negative?

5. A car is travelling at 72 km/h and the brakes are fully applied, producing a constant deceleration of $12 m/s^2$.

a) Verify that the velocity function by v(t) = -12t + 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.