Written Homework Problems §3.4
9 problems for 18 points

§3.4 #151,153,157,159,160,163,164,165*

*For part (d), the values of $N''(t)$ for $t = 0, 10, 20$, and 30 are provided for you in the solutions (in red). You would not be expected to find these yourself. (You have the skills, but it would be pretty tedious.) Given those values, you should be able to interpret them.

Problem A: The position of a hummingbird flying along a straight line in t seconds is given by $s(t) = 3t^3 - 7t$, where s is measured in meters.

(a) Determine the velocity, $v(t)$, and the acceleration, $a(t)$, of the hummingbird.

(b) Find $s(0)$, $s(0.5)$, $s(1)$ and $s(2)$. Include units. Explain what these calculations indicate about the flight path of the bird.

(c) Find the velocity and speed of the hummingbird at $t = 0.5$ seconds. Include units.

(d) Determine the average velocity in the first two seconds of the bird's flight.

(e) Determine if the bird is speeding up or slowing down when $t = 0.5$ seconds and justify your answer.

(f) Find the acceleration of the bird when its velocity is zero. Include units with your answer.