HW 2

Exercise 1. Find the velocity $X'(t)$ of

- $X(t) = (e^t, \cos t, \sin t)$.
- $X(t) = (\sin(2t), \ln(1+t), t)$.

Exercise 2. Let A and B be constant vectors. What is the velocity of

$$X(t) = A + tB?$$

Exercise 3. Prove that if $X(t)$ has constant speed, then the velocity $X'(t)$ is perpendicular to the acceleration $X''(t)$.

Exercise 4. Conversely, show that if $X''(t)$ and $X'(t)$ are perpendicular for all t, then $X(t)$ has constant speed.