MATH 243: SECTION 13.4 GROUPWORK

Suppose a particle moves according to the position function $\vec{r}(t) = \langle t, 2e^t, e^{2t} \rangle$.

(1) Compute the velocity, speed, and acceleration of the particle.[1]
(2) Compute the curvature of the path traced out by the particle in three dimensional space.[2]
(3) Compute the tangential and normal components of the acceleration of the particle.

[1] Hint: $1 + 4e^{2t} + 4e^{4t} = (1 + 2e^{2t})^2$.
[2] See the previous hint.