Calculus Vectors: Motion Along a Curve Day 2

**Ex.** (Calculator)

An object moving along a curve in the *xy*-plane has position $\left〈x\left(t\right),y(t)\right〉$ at time *t*

 with $\frac{dx}{dt}=sin⁡(t^{3})$ and $\frac{dy}{dt}=cos⁡(t^{2})$. At time *t* = 2, the object is at the position (1, 4).

(a) Find the acceleration vector for the particle at *t* = 2.

(b) Write the equation of the tangent line to the curve at the point where *t* = 2.

(c) Find the speed of the vector at *t* = 2.

(d) Find the position of the particle at time *t* = 1.