MATH 243: SECTION 13.2 GROUPWORK

(1) Consider the vector function

$$\vec{r}(t) = \langle t^2, e^t, \sqrt{t} \rangle.$$

Determine the unit tangent vector $\vec{T}(t)$ for the curve given by this function.

(2) Consider the vector function

$$\vec{r}(t) = \langle t^3, t^2, t \rangle.$$

Calculate $\vec{r}\,'(t) \times \vec{r}\,''(t)$.

(3) Consider the 2D vector function

$$\vec{r}(t) = \langle \sin t, 2\cos t \rangle.$$

Calculate

$$\int_0^{2\pi} \vec{r}(t)\,\mathrm{d}t.$$