

Section 13.2: Additional Problems

1. If $f(t) = t^3$ and $\mathbf{r}(t) = \langle e^t, t^2 + 1, \sin(2t) \rangle$.

Compute $\frac{d}{dt} f(t)\mathbf{r}(t)$.

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

(a) Find $T(t)$.

(b) Find an equation of the tangent line at $t = 3$.

(c) Find $\mathbf{r}'(t) \times \mathbf{r}''(t)$ at $t = 2$

3. Find a vector equation for the tangent line to the curve of intersection of the cylinders $x^2 + y^2 = 25$ and $y^2 + z^2 = 20$ at the point $(3, 4, 2)$.