1. Express and draw the projection of the curve onto the given plane.

   (a) $\mathbf{r}(t) = \langle t^2, t^3, t^3 + t^{-3} \rangle$, yz-plane

   (b) $\mathbf{r}(t) = \langle \sin(t), \cos(t), \cos(t/2) \rangle$, xy-plane

2. (a) Find the point on the curve $\mathbf{r}(t) = \langle 2\cos t, 2\sin t, e^t \rangle$, $0 \leq t \leq \pi$, where the tangent line is parallel to the plane $\sqrt{3}x + y = 1$.

   (b) Find a set of a such that the curve $4x^2 + y^2 + z^2 = 4$ intersects with the plane $4x + 2y + z = a$

3. if $f : [0, 2\pi] \to \mathbb{R}^3$ satisfies $f(0) = (0, 0, 0)$, $f'(0) = (0, 1, -1)$, $f''(t) = (1, \cos t, \sin t)$, Find $f(2\pi)$