

**Problem 1**

For the curve  $r(t) = t \cos(t) i + t \sin(t) j + t^2 k$ , write the acceleration  $a$  in the form  $a = a_T T + a_N N$  without finding  $T$  and  $N$ .

## Problem 2

For the curve  $r(t) = \sin(t) i + \cos(t) j + t k$ , find  $T$ ,  $N$ ,  $\kappa$ ,  $B$  and  $\tau$ . Then, at  $t = 0$ , write equations for the osculating, normal and rectifying planes.