

Math 3298 Worksheet 3

Group members (1 to 4): \_\_\_\_\_

- (1) Find the length of the curve  $\vec{r}(t) = (t\sqrt{2}, e^t, e^{-t})$  for  $t$  in the interval  $[0, 1]$ .
- (2) Find the equation for the osculating circle to the curve  $\vec{r}(t) = (e^t \cos(t), e^t \sin(t), t)$  at the point  $(1, 0, 1)$ . (The osculating circle is tangent to the curve at that point, with a curvature equal to the curvature of  $\vec{r}$  at that point. The center of the circle is in the normal direction ( $\vec{N}$ ) from the contact point.)