

Last Name: SOLUNOS

First Name: _____

Student ID: _____

Quiz 5

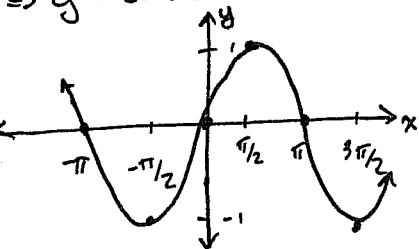
Question 1. (4 marks) Find the limit:

$$\lim_{t \rightarrow \infty} \left\langle \frac{1+t^2}{1-t^2}, \tan^{-1}t, \frac{1-e^{-2t}}{t} \right\rangle = \left\langle \lim_{t \rightarrow \infty} \frac{1+t^2}{1-t^2}, \lim_{t \rightarrow \infty} \tan^{-1}t, \lim_{t \rightarrow \infty} \frac{1-e^{-2t}}{t} \right\rangle$$

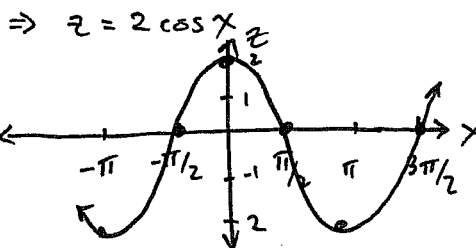
$$= \langle -1, \pi/2, 0 \rangle \quad \leftarrow \text{since } \lim_{t \rightarrow \infty} e^{-2t} = 0$$

Question 2. (6 marks) Draw the projections of $\vec{r}(t) = \langle t, \sin t, 2\cos t \rangle$ on the three coordinate planes and use these projections to help sketch this curve.

XY-PLANE: $x = t, y = \sin t$
 $\Rightarrow y = \sin x$



XZ-PLANE: $x = t, z = 2\cos t$



YZ-PLANE: $\sin^2 t + \cos^2 t = y^2 + \left(\frac{z}{2}\right)^2 = 1$

