Math 001C Assignment 13.1 Name:______________________________

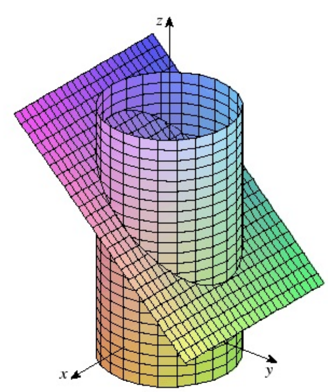
DIRECTIONS To receive full credit, you must provide complete legible solutions to the following problems in the space provided. No Attached papers. Transfer all your answers to the space provided.

1. Find the domain of the vector function. Ans____________________

$$\mathbf{r}(t)=\left\langle 9-t^2, e^{-3t}, \ ln(t+2)\right\rangle$$

2. Find the limit $\lim\limits_{t\to 0}\left\langle \dfrac{3e^t-3}{t}, \dfrac{\sqrt{1+t}-1}{t}, \dfrac{2}{1+t}\right\rangle$ Ans____________________

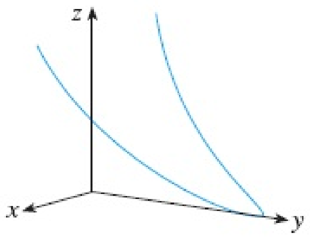
3. Find a vector function that represents the curve of intersection of the cylinder $x^2+y^2=4$ and the plane $5y+z=11$.



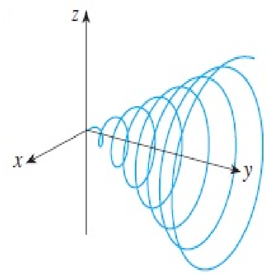
4. Match the parametric equations with the correct graph.

a. $x = t\cos t,\quad y = t,\quad z = t\sin t,\quad t \geq 0$ $\qquad x = \cos 7t,\ y = \sin 7t,\ z = e^{0.7t},\ t \geq 0$

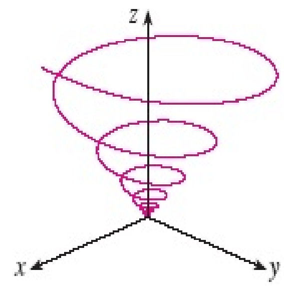
c. $x = e^{-t}cos(3t), y = e^{-t}sin(3t), z = e^{-t}$ $\qquad x = cos(t), y = sin(t), z = sin(5t)$



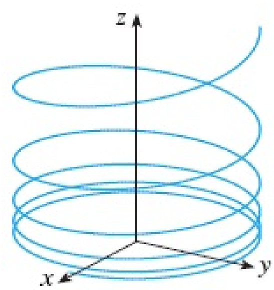
I



II



III



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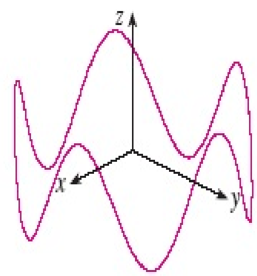
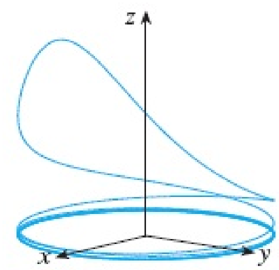


V



VI

5. Find a vector function, **r**(t), that represents the curve of intersection of the two surfaces. The paraboloid $z = 7x^2 + y^2$ and the parabolic cylinder $y = 6x^2$ Ans____________________

6. Two particles travel along the space curves

$$\mathbf{r}_1(t) = \langle t, t^2, t^3 \rangle \quad \mathbf{r}_2(t) = \langle 1+6t, 1+30t, 1+126t \rangle$$

a. Find the points at which their paths intersect. Ans____________________

b. Find the points where the particles collide. Ans____________________