"QUIZ" for Lecture 4

NAME: (print!) SAI EMBAR **Section:** 23

E-MAILSCANNED .pdf OF COMPLETED QUIZ to DrZcalc3@gmail.com (Attachment: q4FirstLast.pdf) ASAP BUT NO LATER THAN Sept. 17, 8:00pm

1. Find a parametric equation for the tangent line to the curve with the given parametric equation at the specified point

$$x = \cos t \quad , \quad y = \sin t \quad , \quad z = t^2 + 1 \quad ; \quad (1, 0, 1)$$

$r(t) = \langle \cos(t), \sin(t), t^2+1 \rangle = \langle 1, 0, 1 \rangle$

$\cos(t) = 1, \sin(t) = 0, t^2+1 = 1 \rightarrow t = 0, t = 0, t = 0, t = 0$

$r'(t) = \langle -\sin(t), \cos(t), 2t \rangle$

$r'(0) = \langle 0, 1, 0 \rangle$ direction vector

$(1,0,1) + t\langle 0,1,0 \rangle = \langle 1,0,1 \rangle + \langle 0,t,0 \rangle = \langle 1, t, 1 \rangle$

$x(t) = 1, \quad y(t) = t, \quad z(t) = 1$

2. Find $\mathbf{r}(t)$ if

$$\mathbf{r}'(t) = t\mathbf{i} + 2\mathbf{j} + (t+1)\mathbf{k}$$

and

$$\mathbf{r}(0) = \mathbf{i} + 2\mathbf{j} + 3\mathbf{k} \quad .$$

$r(t) = \frac{1}{2}t^2 i + 2tj + (\frac{1}{2}t^2 + t)k + C \Big|_{t=0} = \frac{1}{2}(0)^2 i + 2(0)j + (\frac{1}{2}(0)^2 + (0))k + C = C$

$C = i + 2j + 3k$

$r(t) = \frac{1}{2}t^2 i + 2tj + (\frac{1}{2}t^2 + t)k + i + 2j + 3k$

$r(t) = (\frac{1}{2}t^2 + t)i + (2t + 2)j + (\frac{1}{2}t^2 + t + 3)k$