

“QUIZ” for Lecture 4

NAME: (print!) _____ Section: _____

E-MAIL SCANNED .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

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

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

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

$$r(0) = \langle 1, 0, 1 \rangle$$

$$\Rightarrow \langle 1, 0, 1 \rangle + t \langle 0, 1, 0 \rangle$$

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

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

2. Find $r(t)$ if

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

and

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

$$r(t) = \int (t\mathbf{i} + 2\mathbf{j} + (t+1)\mathbf{k}) dt = \frac{t^2}{2}\mathbf{i} + 2t\mathbf{j} + \left(\frac{t^2}{2} + t\right)\mathbf{k} + C$$

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

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