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"QUIZ" for Lecture 4

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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

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

$x' = -\sin(t)$, $y' = \cos(t)$, $z = 2t$; $(1,0,1)$

$l(t) = \langle x(t) = \cos(1) + t(-\sin(1)),\ y(t) = \sin(0) + t\cos(0),\ z(t) = 2 + t(2) \rangle$

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

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

and

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

$\int r'(t)\,dt = \left\langle \int t\,dt, \int 2\,dt, \int (t+1)\,dt \right\rangle = \left\langle \frac{t^2}{2}, 2t, \frac{t^2}{2} + t \right\rangle$

$r(t) = \left\langle \frac{t^2}{2} + C, 2t + C, \frac{t^2}{2} + t + C \right\rangle$

$x(0) = \frac{0^2}{2} + C_1 = 1$

$C_1 = 1$

$y(0) = 2(0) + C_2 = 2$

$C_2 = 2$

$z(0) = \frac{0^2}{2} + 0 + C_3 = 3$

$C_3 = 3$

$\boxed{r(t) = \left\langle \frac{t^2}{2} + 1, 2t + 2, \frac{t^2}{2} + t + 3 \right\rangle}$