"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

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

$\text{slope}_{\tan} = f'(x)$

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

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

$r'(t_0) = \langle -\sin 0 \; ; \cos 0 \; , \; 2(0) \rangle$

$r'(t_0) = \langle 0, 1, 0 \rangle$

$f_1(t_0) = p_1, \; f_2(t_0) = p_2, f_3(t_0) = p_3$

$\cos t_0 = 1, \; \sin t_0 = 0, \; t_0^2 + 1 = 1$

$t_0 = 0 \quad t_0 = 0 \quad t_0 = 0$

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

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

$\langle 1, t, 1 \rangle$

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

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

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

and

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

$r(t) = \int r'(t)\, dt$

$r(t) = \int t\mathbf{i} + 2\mathbf{j} + (t+1)\mathbf{k} \; dt$

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

$\mathbf{i} + 2\mathbf{j} + 3\mathbf{k} = \frac{(0^2)}{2}\mathbf{i} + 2(0)\mathbf{j} + \left(\frac{(0^2)}{2} + 0\right)\mathbf{k} + C$

$C = \mathbf{i} + 2\mathbf{j} + 3\mathbf{k}$

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