

"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

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

$$\cos t = 1 \quad t = 0$$

$$\sin t = 0 \quad t = 0$$

$$t^2 + 1 = 1 \quad t = 0$$

$$r'(t) = \langle \sin t, \cos t, 2t \rangle \\ \langle 0, 1, 0 \rangle$$

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

$$\begin{aligned} X(t) &= 1 \\ Y(t) &= t \\ Z(t) &= 1 \end{aligned}$$

2. Find $r(t)$ if

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

and

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

$$\frac{1}{2}t^2 \mathbf{i} + t^3 \mathbf{j} + t \mathbf{i} \\ - \frac{1}{2}t^2 \mathbf{j} + \frac{1}{2}t^2 \mathbf{j}$$

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

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

$$t \mathbf{i} - \frac{1}{2}t^2 \mathbf{j} + 2\mathbf{j} - \frac{j^2}{2} - t \left(\frac{t^2}{2} + t \right) \quad C = \mathbf{i} - \frac{1}{2}t^2 + 2\mathbf{j} - \frac{j^2}{2} - t \left(\frac{t^2}{2} + t \right)$$