



BIRZEIT UNIVERSITY

Department of Mathematics

Quiz 1

Math 2311-Calculus III

September 25, 2018

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First Semester 2018/2019

Name: _____ Number: _____ Section: 4

Question One (10 points). Consider the following curve

$$C: (x-1)^2 + 4(y+2)^2 = 4, \quad z=2.$$

(a) Represent the curve C in the parametric form.

(b) Find parametric equations for the line that is tangent to the curve C at the point $P(1, -1, 2)$.

(a) put $x-1 = 2\sin t \Rightarrow x = 1 + 2\sin t$
 $y+2 = \cos t \Rightarrow y = -2 + \cos t$
 $z = 2$

$$\therefore \vec{r}(t) = (1 + 2\sin t)\mathbf{i} + (-2 + \cos t)\mathbf{j} + 2\mathbf{k}$$

(b) $\frac{d\vec{r}}{dt} = (2\cos t)\mathbf{i} - \sin t\mathbf{j}$

Notice $\vec{r}(0) = \mathbf{i} - 1\mathbf{j} + 2\mathbf{k} \Rightarrow P(1, -1, 2)$

$$\left. \frac{d\vec{r}}{dt} \right|_{t=0} = 2\mathbf{i}$$

Good Luck

\therefore the parametric eqs are

$$x = 1 + 2t, \quad y = -1, \quad z = 2, \quad t \in \mathbb{R}$$