BIRZEIT UNIVERSITY

Department of Mathematics

Quiz 1

Math 2311-Calculus III **September 25, 2018**

Instructor: Dr. Ala Talahmeh **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) (4 pts) put $x-1 = 2\sin t \Rightarrow x = 1+2\sin t$

$y+2 = \cos t \Rightarrow y = -2+\cos t$

$z = 2$

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

(b) (6 pts) $\frac{d\vec{r}}{dt} = (2\cos t)\,i - \sin t\, j$

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

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

Good Luck

$\therefore$ the parametric eqs are

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