MATH 202 Name : SOLUTIONS

Quiz 23 February 13, 2012

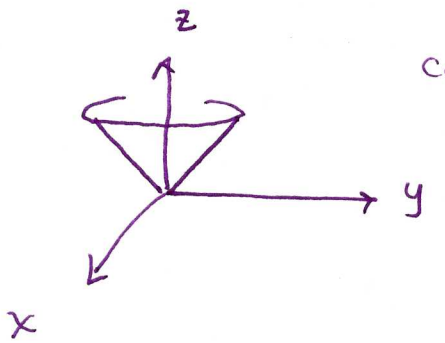
Instructions: Point values as indicated. You get one point for taking this quiz.

1. (2 pts.) Consider the surface in $\mathbb{R}^3$ given in cylindrical coordinates by the equation

$$z = r, \quad \text{for } r \geq 0.$$

Give the equation for this surface in rectangular coordinates and sketch it.

$z = \sqrt{x^2+y^2}$



upper-half cone

2. (2 pts. – 1 pt each) A vector-valued function is given by

$$\vec{r}(t) = \langle 3\sec(t),\ 2\ln\left(\frac{8}{\pi}t - 1\right),\ e^{\sin(t)} \rangle$$

for values of $t \in (0, \frac{\pi}{3}]$.

(a) Find $\vec{r}(\frac{\pi}{4})$. $\vec{r}(\pi/4) = \langle 3\sec(\pi/4),\ 2\ln\left(\frac{8}{\pi}\cdot\frac{\pi}{4} - 1\right),\ e^{\sin(\pi/4)} \rangle$

$= \langle 3\sqrt{2},\ 2\ln(2-1),\ e^{\sqrt{2}/2} \rangle$

(b) Now find the derivative $\vec{r}\,'(t)$. $= \boxed{\langle 3\sqrt{2},\ 0,\ e^{\sqrt{2}/2} \rangle}$

$\vec{r}\,'(t) = \langle 3\sec t\tan t,\ \frac{2}{\left(\frac{8}{\pi}t - 1\right)}\cdot\frac{8}{\pi},\ e^{\sin(t)}\cos t \rangle$

$\boxed{\vec{r}\,'(t) = \langle 3\sec t\tan t,\ \frac{16}{8t-\pi},\ \cos(t)\,e^{\sin(t)} \rangle}$