Quiz 7 (10pts)
Math 214 Section Q1 Winter 2010

Your name:_____ ID#:_____

Please, use the reverse side if needed.

1.(5 pts) Find the distance from the point $P(2,-3,1)$ to the plane

$$2x+2y-z-6=0.$$

Solution.

$$d=\frac{|2\cdot 2+2\cdot(-3)-1\cdot 1-6|}{\sqrt{2^2+2^2+(-1)^2}}=\frac{|-9|}{3}=3.$$

2.(5 pts) Find parametric equations for the line that is tangent to the curve $\mathbf{r}(t)=\ln t\ \mathbf{i}-2t\mathbf{j}-t^3\mathbf{k}$ at $t=1$.

Solution.

$$\mathbf{r}(1)=-2\mathbf{j}-\mathbf{k},$$

$$\frac{d\mathbf{r}}{dt}=\frac{1}{t}\mathbf{i}-2\mathbf{j}-3t^2\,\mathbf{k},$$

$$\frac{d\mathbf{r}}{dt}(1)=\mathbf{i}-2\mathbf{j}-3\mathbf{k}.$$

Tangent line:

$$\begin{aligned} x &= \tau, \\ y &= -2-2\tau, \qquad -\infty<\tau<\infty. \\ z &= -1-3\tau, \end{aligned}$$

(Using t instead of τ is also OK).