Wenhao Li

22, 23, 24

NAME: (print!) _____ **Section:** _____

E-MAIL SCANNED .pdf OF COMPLETED QUIZ to DrZcalc3@gmail.com (Attachment: q5FirstLast.pdf) ASAP BUT NO LATER THAN Sept. 21, 8:00pm

1, Find the curvature for
$$\mathbf{r}(t) = \sin t\,\mathbf{i} + \cos t\mathbf{j} + t\,\mathbf{k} \quad .$$

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r'(t)=costi-sintj+k
r"(t)=-sinti-costj+0

r'(t)*r"(t)=<cost,sint,-cos^2t-sin^2t>
|r'(t)*r"(t)|=sqrt(cos^2t+sin^2t+(-cos^2t-sin^2t)^2)
|r'(t)|=sqrt(cos^2t+(-sint)^2+1^2)
k(t)=sqrt(cos^2t+sin^2t+(-cos^2t-sin^2t)^2)/(sqrt(cos^2t+(-sint)^2+1^2))^3
```

2.: Find the velocity, acceleration, and speed of a particle with the given position function.

$$\mathbf{r}(t) = t\,\mathbf{i} + t^2\,\mathbf{j} + 5\,\mathbf{k} \quad .$$

```
v(t)=r'(t)=1i+2tj+0k
a(t)=v'(t)=0i+2j+0k
speed |v(t)|=sqrt(1^2+2t^2+0)=sqrt(1+4t^2+0)
```