

MATH 234, Lec. 2, EXAM # 1

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YOUR NAME

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T.A.'s NAME

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DISC. SEC. (Time and Day)

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Show all your work. No calculators or references.

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1.(20 points)
2.(20 points)
3.(20 points)
4.(20 points)
5.(20 points)
Total

1.

(a)

Find the equation of the plane containing the three points  $(1,1,1)$ ,  $(2,1,2)$ ,  $(2,2,1)$ .

(b)

Find the distance between the two parallel planes  $x + y + z = 1$  and  $x + y + z = 5$ .

2. Find the length of the curve  $\vec{r}(t) = e^t \hat{i} + e^t \cos(t) \hat{j} + e^t \sin(t) \hat{k}$  for  $0 \leq t \leq 1$ .

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3. A particle moves along the path  $\vec{r}(t) = (1/t)\hat{i} + \hat{j} + t^2\hat{k}$ .  
Find the tangential and normal components of the acceleration  
at  $t = 1$ .

4. Find the unit tangent, principle normal, and binormal for the curve  $\vec{r}(t) = t\hat{i} + t^2\hat{j} + t\hat{k}$  at  $t = 1$ .

5.

(a)

A point has spherical coordinates  $\rho = 4$ ,  $\theta = \pi/4$ ,  $\phi = \pi/3$ .  
Find the cylindrical coordinates of the point.

(b)

$\rho = 2 \cos(\phi)$  describes a surface in spherical coordinates.  
Find the equation of the surface in cartesian coordinates.