Math 49B (8:30am – 9:20am)
Quiz 7 Version A
Fri Mar 4, 2011

What month is your birthday ? ___ ___
What are the first 2 digits of your address ? ___ ___
What are the last 2 digits of your zip code ? ___ ___
What are the last 2 digits of your DeAnza ID number ? ___ ___

SCORE: ___ / 30 POINTS

NO CALCULATORS ALLOWED
YOU MUST SHOW APPROPRIATE WORK TO RECEIVE FULL CREDIT
NO CREDIT FOR GUESS & CHECK

Find parametric equations for the line through the point $(-2, 3, 0)$ **SCORE: ___ / 3 POINTS**

and parallel to the line $x+4=\frac{y-8}{-7}=\frac{z-5}{9}$.

$x = t-2$
$y = -7t+3$
$z = 9t$

Find symmetric equations for the line through the points $(1, -3, 4)$ and $(-4, -2, 7)$. **SCORE: ___ / 4 POINTS**

DIRECTION VECTOR $\langle -4-1, -2-(-3), 7-4\rangle = \langle -5, 1, 3\rangle$

$$\frac{x-1}{-5} = y+3 = \frac{z-4}{3}$$

Find the equation of the plane through the point $(0, 6, -1)$ and perpendicular to the line $x = 3-t$, $y = 5t$, $z = 2t-9$. **SCORE: ___ / 3 POINTS**

$-1(x-0)+5(y-6)+2(z-(-1))=0$
$-x+5(y-6)+2(z+1)=0$
$-x+5y+2z=28$

Write the augmented matrix for the system $-x+3z=2$, $4y-7z=-5$, $3x-6y+z=0$. **DO NOT SOLVE THE SYSTEM.** **SCORE: ___ / 3 POINTS**

$$\left[\begin{array}{ccc|c} -1 & 0 & 3 & 2 \\ 0 & 4 & -7 & -5 \\ 3 & -6 & 1 & 0 \end{array}\right]$$

Solve the system $x-y=2$, $x^2-2y=7$ by substitution. Write your final answer(s) in ordered pair form (x, y). **SCORE: ___ / 5 POINTS**

$x = y+2$
$(y+2)^2-2y=7$
$y^2+2y-3=0$
$(y+3)(y-1)=0$
$y=-3,1 \rightarrow x=-1,3$

OR

$y = x-2$
$x^2-2(x-2)=7$
$x^2-2x-3=0$
$(x-3)(x+1)=0$
$x=3,-1 \rightarrow y=1,-3$

$(-1,-3), (3,1)$

Find the equation of the plane through the points $(1,-2,4)$, $(3,1,-1)$ and $(5,3,-3)$. **SCORE: ___ / 6 POINTS**

Write your final answer in general form $Ax+By+Cz=D$.

$\langle 3-1, 1--2, -1-4\rangle = \langle 2,3,-5\rangle$

$\langle 5-3, 3-1, -3--1\rangle = \langle 2,2,-2\rangle$

$$\begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ 2 & 3 & -5 \\ 2 & 2 & -2 \end{vmatrix} \begin{matrix} \vec{i} & \vec{j} \\ 2 & 3 \\ 2 & 2 \end{matrix} = -6\vec{i} - 10\vec{j} + 4\vec{k} = \langle 4,-6,-2\rangle$$
$$+10\vec{i} + 4\vec{j} - 6\vec{k}$$

$$4(x-1)-6(y--2)-2(z-4)=0$$
$$4x-6y-2z=8$$
$$2x-3y-z=4$$

Solve the system $\begin{aligned} x+2y-z&=2 \\ 3x+5y&=9 \\ -4y+5z&=-2 \end{aligned}$ using the method of your choice. **SCORE: ___ / 6 POINTS**

If you use elimination, you MUST state what operations you are performing. You may use the notation shown in lecture.

$$\left[\begin{array}{ccc|c} 1 & 2 & -1 & 2 \\ 3 & 5 & 0 & 9 \\ 0 & -4 & 5 & -2 \end{array}\right] R_2+(-3)R_1 \to R_2$$

$$\left[\begin{array}{ccc|c} 1 & 2 & -1 & 2 \\ 0 & -1 & 3 & 3 \\ 0 & -4 & 5 & -2 \end{array}\right] -R_2$$

$$\left[\begin{array}{ccc|c} 1 & 2 & -1 & 2 \\ 0 & 1 & -3 & -3 \\ 0 & -4 & 5 & -2 \end{array}\right] R_3+4R_2 \to R_3$$

$$\left[\begin{array}{ccc|c} 1 & 2 & -1 & 2 \\ 0 & 1 & -3 & -3 \\ 0 & 0 & -7 & -14 \end{array}\right] -\tfrac{1}{7}R_3 \to R_3$$

$$\to \left[\begin{array}{ccc|c} 1 & 2 & -1 & 2 \\ 0 & 1 & -3 & -3 \\ 0 & 0 & 1 & 2 \end{array}\right]$$

$z=2$

$y-3z=-3$

$y=-3+3z=3$

$x+2y-z=2$

$x=2-2y+z=-2$

$(-2,3,2)$