

**Math 1312**  
**Spring 2005**  
**Pretest III**

1. Use the method of elimination to determine whether the given linear system is consistent or inconsistent. For a consistent system, find the solution if it is unique; otherwise, describe the infinite solution set in terms of an arbitrary parameter  $t$ .

$$x + 3y + 2z = 5,$$

$$x - y + 3z = 3,$$

$$3x + y + 8z = 10$$

2. Write both symmetric and parametric equations of the line that passes through  $P_1(1, -1, 0)$  and is parallel to  $\mathbf{v} = (2, -1, 3)$ .

3. Find  $A^{-1}$  if it exists for

$$A = \begin{pmatrix} 2 & 7 & 3 \\ 1 & 3 & 2 \\ 3 & 7 & 9 \end{pmatrix}$$

4. Determine whether the two lines  $L_1$  and  $L_2$  are parallel, skew, or intersecting. If they intersect, find the point of intersection.

$$L_1 : x = 14 + 3t, \quad y = 7 + 2t, \quad z = 21 + 5t;$$

$$L_2 : x = 5 + 3s, \quad y = 15 + 5s, \quad z = 10 + 7s$$

5. Write an equation of the plane through  $P(5, 1, 4)$  and parallel to the plane with equation  $x + y - 2z = 0$ .

6. Find an equation for the plane that passes through the point  $P(1, 3, -2)$  and contains the line of intersection of the planes  $x - y + z = 1$  and  $x + y - z = 1$ .