Name:_____

Math 1312
Spring 2005
Test 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.

$$\begin{aligned} x - 3y + 2z &= 6, \\ x + 4y - z &= 4, \\ 5x + 6y + z &= 20 \end{aligned}$$

2. Write both symmetric and parametric equations of the line that passes through $P_1(1, -1, 2)$ and $P_2(3, 2, -1)$.

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

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

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

$$L_1 : \frac{1}{4}(x - 11) = y - 6 = -\frac{1}{2}(z + 5);$$
$$L_2 : \frac{1}{6}(x - 13) = -\frac{1}{3}(y - 2) = \frac{1}{8}(z - 5)$$

5. Write an equation of the plane through two points $A(1, 0, -1)$, $B(3, 3, 2)$, and $C(4, 5, -1)$.

6. Find an equation of the plane through $P(3, 3, 1)$ that is perpendicular to the planes $x + y = 2z$ and $2x + z = 10$.