EXAM 2 - MATH 251 Friday, February 22

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Read each problem **very carefully** before starting to solve it. Each problem is worth 10 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

1. Find the area of the parallelogram with vertices $K(1,2,3), L(1,3,6), M(3,8,6)$ and $N(3,7,3)$.

2. Determine whether the points $A(1,3,2), B(3,-1,6), C(5,2,0)$ and $D(3,6,-4)$ lie in the same plane.

3. Find an equation of the plane that passes through the line of intersection of the planes $x - z = 1$ and $y + 2z = 3$ and is perpendicular to the plane $x + y - 2z = 1$.

4. Find the distance between the parallel planes $3x + 6y - 9z = 4$ and $x + 2y - 3z = 1$.

5. Find the unit tangent vector $\mathbf{T}(t)$ at the point of the curve $\mathbf{r}(t) = \cos 3t\mathbf{i} + \sin 4t\mathbf{j} + t\mathbf{k}$, with $t = \frac{\pi}{2}$.