

Math 241, Exam 1, Fall, 2017 11:40 class

Write everything on the blank paper provided. **You should KEEP this piece of paper.** If possible: return the problems in order (use as much paper as necessary), use only one side of each piece of paper, and leave 1 square inch in the upper left hand corner for the staple. If you forget some of these requests, don't worry about it – I will still grade your exam.

The exam is worth 50 points. Each problem is worth 10 points. Please make your work coherent, complete, and correct. Please CIRCLE your answer. Please **CHECK** your answer whenever possible.

The solutions will be posted later today.

The exams will be returned on Tuesday.

No Calculators, Cell phones, computers, notes, etc.

- (1) Find a system of parametric equations for the line through the points $P_1 = (1, 2, 0)$ and $P_2 = (1, 1, -1)$. **Check your answer. Make sure it is correct.**
- (2) Find an equation for the plane through the points $P_1 = (1, -1, 2)$, $P_2 = (2, 1, 3)$, and $P_3 = (-1, 2, -1)$. **Check your answer. Make sure it is correct.**
- (3) Express $\vec{v} = 4\vec{i} + \vec{j}$ as the sum of a vector parallel to $\vec{b} = 2\vec{i} + 3\vec{j}$ and a vector orthogonal to \vec{b} . **Check your answer. Make sure it is correct.**
- (4) Find the center and radius of the sphere

$$x^2 + y^2 + z^2 - 8x - 6y + 10z + 34 = 0.$$

- (5) Find the distance from the point $(2, 1, 3)$ and the line

$$\begin{cases} x = 5 + 2t \\ y = 1 + 6t \\ z = 3. \end{cases}$$