DO NOT WRITE ABOVE THIS LINE!!

MATH 210 1st exam

September 15, 2020

Instructions

- **READ THE INSTRUCTIONS BEFORE STARTING**
- Print this exam with the exception of the cover page.
- All of your work must fit within the boxes. Nothing outside of the box will be graded!
- If you don't have access to a printer, then use **five (5)** separate pages and solve **one problem on each page.**
- A solution for one problem may not go on another page.
- Show all your work. Unjustified answers are not correct. Make clear what your final answer is.
- Use **one hour** in order to complete the 5 questions and ten minutes to scan it and upload it
- By taking the exam you accept to comply with the rule of **not using outside assistance** (notes, internet, live sources,...) during the exam.
- When you are done, take pictures of the pages and upload them on Gradescope.
- Make sure that you **assign every page correctly** to its corresponding problem.
- **For students with an LOA** Please use the amount of time that your LOA specifies. Once you are done, email the exam directly to your instructor.

Write solution only inside the box

1. **(10pt)** Let $\mathbf{u} = \langle 1, 3, 2 \rangle$ and $\mathbf{v} = \langle 1, 2, -2 \rangle$.
i) Determine whether the angle between the two vectors is acute, right or obtuse.
ii) Find the projection of $\mathbf{u}$ onto $\mathbf{v}$.

Write solution only inside the box

2. **(10pt)** Let $A(1,-1,2)$, $B(1,2,3)$ and $C(1,2,-1)$ be three points in space. Compute the cross product: $\overrightarrow{AB} \times \overrightarrow{AC}$.

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3. **(10pt)** Suppose that the plane $z = x - 2y + 1$ is perpendicular to a line that contains the point $(1, 2, -1)$. Find a vector equation for this line.

Write solution only inside the box

4. **(10pt)** Find the point of intersection of the plane $x + 5y + z = 1$ with the line that has vector equation $\mathbf{r}(t) = \langle 2t + 1, 1 - t, t + 3 \rangle$.

Write solution only inside the box

5. **(10pt)** Consider the planes with equations $x - y + z = 3$ and $x + y - z = 1$. These two planes intersect along a line. Find a unit vector which is parallel to the intersection of the two planes.