

Your Name

Your Signature

Student ID #

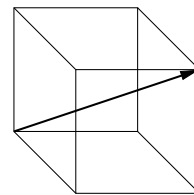
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	Hanchao		Avi	
Section	12:30	1:30	12:30	1:30
(circle one)	EA	EB	EC	ED

Problem	Total Points	Score
1	8	
2	10	
3	10	
4	12	
5	10	
Total	50	

- This exam is closed book. You may use one $8\frac{1}{2} \times 11$ sheet of notes.
- Graphing calculators are not allowed.
- Do not share notes.
- In order to receive credit, you must show your work. Explain why your answers are correct.
- Place a box around **YOUR FINAL ANSWER** to each question.
- If you need more room, use the backs of the pages and indicate to the reader that you have done so.
- Raise your hand if you have a question.

- 1 (8 points) Find the angle between a diagonal of a cube and one of its edges. Give your answer rounded to the nearest degree.



- 2 (10 points) Let $\mathbf{r}(t) = 3t^3\mathbf{i} + 5t^2\mathbf{j}$. Compute all the points on the curve where the tangent line passes through the point $(12, 0)$.

3 (10 points) Compute symmetric equations for the line of intersection of the planes $2x + y - z = 2$ and $x - y - 2z = 1$. Where does this line intersect the plane $x - z = 1$?

4 (12 points) Let $\mathbf{r}(t) = \langle \cos(\pi t), t \sin(\pi t), t^3 \rangle$.

(a) Give parametric equations for the tangent line to this curve at the point $(1, 0, -8)$.

(b) Compute the curvature at the given point.

5 (10 points) Consider the polar curve $r = e^{2\theta}$ where $0 \leq \theta \leq 2\pi$. Find all points on the curve where the tangent line has slope 3. Give your answer in xy coordinates.