MATH 142: Exam 1 **Name:** _____
Spring — 2025
02/13/2025
75 Minutes

Write your name on the appropriate line on the exam cover sheet. This exam contains 9 pages (including this cover page) and 8 questions. Check that you have every page of the exam. Answer the questions in the spaces provided on the question sheets. Be sure to answer every part of each question and show all your work. If you run out of room for an answer, continue on the back of the page — being sure to indicate the problem number.

Choose any of the seven questions in this exam. Only these seven problems will be graded. Indicate which you do not want to be graded by circling that problem number on this cover page.

Question	Points	Score
1	10	
2	10	
3	10	
4	10	
5	10	
6	10	
7	10	
8	10	
Total:	80	

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1. (10 points) Showing all your work, integrate the following:

   (a) $\int \sin^2 \theta \, d\theta$

   (b) $\int \frac{3x - 7}{x^2 + 1} \, dx$

2. (10 points) Showing all your work, integrate the following:

$$\int_0^{\pi/4} \sec^4\theta \, \tan^3\theta \, d\theta$$

3. (10 points) Showing all your work, integrate the following:

$$\int \frac{dx}{\sqrt{x^2 - 9}}$$

4. (10 points) Showing all your work, integrate the following:

$$\int_0^4 \frac{dx}{\sqrt{4-x}}$$

5. (10 points) Showing all your work, integrate the following:

$$\int x^3 e^{2x}\, dx$$

6. (10 points) Showing all your work, integrate the following:

$$\int e^x \cos(2x)\, dx$$

7. (10 points) Showing all your work, integrate the following:

$$\int_1^e \frac{\ln x}{x^2}\, dx$$

8. (10 points) Showing all your work, integrate the following:

$$\int \frac{x^2 + 5x + 6}{(x-1)(x+1)^2}\, dx$$