

Name: _____

_____ / 25

30 minutes maximum. No aids (book, calculator, etc.) are permitted. Show all work and use proper notation for full credit. Answers should be in reasonably-simplified form. 25 points possible.

1. [4 points] Compute and simplify the indefinite integral:

$$\int \sin^3 \theta \cos^3 \theta d\theta =$$

2. [4 points] Compute and simplify the definite integral:

$$\int_{-2}^0 x e^x dx =$$

3. [5 points] Find the area of the region bounded by $y = e^x \sin x$ and the x -axis, on the interval $0 \leq x \leq \pi$.

4. [4 points] Compute and simplify the indefinite integral:

$$\int t^3 \ln t \, dt =$$

5. [4 points] Compute and simplify the indefinite integral. (*Hint. You may have this integral memorized, but I have asked you to remember the trick which does it. So please apply the trick!*)

$$\int \sec x dx =$$

6. [4 points] Compute and simplify the indefinite integral:

$$\int \cos^2 x \sin^2 x dx =$$

EC. [1 points] (Extra Credit) Assume n is a large integer. One of these indefinite integrals is much easier than the other. Circle the easier one, and do it.

$$\int \sec^n x \tan x dx$$

$$\int \tan^n x \sec x dx$$

BLANK SPACE