

MATH 22 PRACTICE EXAM ON AREA BETWEEN CURVES

Name:

Section:

Instructions:

- (1) Books, notes, and calculators are not permitted.
- (2) Simplify as instructed. On some problems, unsimplified correct answers will not receive full credit.
- (3) Show your work as instructed. On some problems, correct answers without justification will not receive full credit.

(1)

(2)

(3)

(4)

(5)

Total

Problem 1. (5 pts.) Circle the correct answer. There will be no partial credit. You do not need to show your work.

Which of the following integrals gives the area bounded by the two curves $y = x^3 - x$ and $y = 6x$?

A. $\int_{-2}^2 (x^3 - 7x) dx.$

B. $\int_{-2}^2 (7x - x^3) dx.$

C. $2 \int_0^2 (x^3 - 7x) dx.$

D. $2 \int_0^2 (7x - x^3) dx.$

E. None of these.

Problem 2. (5 pts.) Circle the correct answer. There will be no partial credit. You do not need to show your work.

Consider the regions between

- I. the x -axis and the curve $y = \sin x$, $0 \leq x \leq \pi$,
- II. the curves $y = \sin x$ and $y = 2 \sin x$, $0 \leq x \leq \pi$,
- III. the curves $y = 2 \sin x$ and $y = 3 \sin x$, $0 \leq x \leq \pi$.

Which of the regions has the greatest area?

A. I.

B. II.

C. III.

D. All three regions have equal area.

E. None of these.

Problem 3. (15 pts.) Sketch the region bounded by the curves $y = 1 - 2x^2$ and $y = |x|$. Find the area of this region. Simplify your answer.

Problem 4. (15 pts.) Sketch the region bounded by the curves $x + y = 0$ and $x = y^2 + 3y$. Find the area of this region. Simplify your answer.

Problem 5. (15 pts.) Sketch the region bounded by the curves $y = \sin(\pi x/2)$ and $y = x^2 - 2x$. Find the area of this region. Simplify your answer.

Problem 6. (15 pts.) Sketch the region bounded by the curves $y = \sqrt{x}$, $y = x^2$, and the line $x = 2$. Find the area of this region. Simplify your answer.