

NAME _____

10-DIGIT PUID _____

RECITATION INSTRUCTOR _____

RECITATION TIME _____

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DIRECTIONS

1. Write your name, 10-digit PUID, recitation instructor's name and recitation time in the space provided above. Also write your name at the top of pages 2, 3, and 4.
2. The test has four (4) pages, including this one.
3. Write your answers in the boxes provided.
4. You must show sufficient work to justify all answers unless otherwise stated in the problem. Correct answers with inconsistent work may not be given credit.
5. Credit for each problem is given in parentheses in the left hand margin.
6. No books, notes, calculators nor any electronic devices may be used on this test.

Find the integrals in problems 1-6.

(6) 1. $\int_0^{\frac{\pi}{4}} \cos^2 x \, dx$

(9) 2. $\int \frac{\sqrt{x^2 - a^2}}{x^4} \, dx$

(9) 3. $\int \frac{dx}{\sqrt{4 - (x + 3)^2}}$

(11) 4. $\int \frac{x^2 + 8x - 3}{x^3 + 3x^2} dx$

(9) 5. $\int \frac{\cos x}{\sin^2 x + \sin x} dx$

(6) 6. $\int \frac{x+1}{x^2+9} dx$

(10) 7. Find the area of the region under the curve $y = \frac{x+1}{x-1}$ from $x = 2$ to $x = 3$.

(10) 8. Determine whether the integral below is convergent or divergent. Find its value if it is convergent. Important: You must use the definition of improper integrals.

$$\int_{-\infty}^0 \frac{1}{2x-5} dx$$

(6) 9. Circle T if true or F if false.

(a) $\int_1^{\infty} \frac{1}{x\sqrt{x}} dx$ is divergent

T F

(b) $\int_{-1}^2 \frac{1}{x^2} dx = -\frac{3}{2}$

T F

(c) $\int_0^1 \frac{1}{\sqrt{1-x}} dx$ is convergent

T F