

## Instructions:

- Do not open the exam until you are instructed to do so.
- Write your name and student ID number on the front page of the exam.
- Write your name and student ID number at the top of every page of the exam.
- Answer the questions in the space provided, if you run out of room, continue on the back side of the page.
- If you need scratch paper, ask one of the proctors and we will provide it.

## Math 20B - Midterm 2 - 11/14/2018

Name & Student ID: \_\_\_\_\_

Question:	1	2	3	4	Total
Points:	10	10	10	10	40

Name & Student ID: \_\_\_\_\_

Scratch paper.

Name & Student ID: \_\_\_\_\_

1. (a) (5 points) Compute the complex number  $\frac{(1+i)^4}{3i}$ . Express your answer either in polar coordinates  $(r, \theta)$  or as  $re^{i\theta}$ .

- (b) (5 points) Find the antiderivative:

$$\int \cos^3(x)\sin^2(x)dx.$$

Show your work!

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Extra paper for problem 1.

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2. (10 points) Use trigonometric substitution to compute the antiderivative

$$\int \frac{1}{(x^2 + 4)^{3/2}} dx.$$

Show your work!

Name & Student ID: \_\_\_\_\_

Extra paper for problem 2.

Name & Student ID: \_\_\_\_\_

3. (10 points) Use partial fractions to evaluate the integral:

$$\int \frac{x^3 + 1}{x^2(x^2 + 1)} dx.$$

Show your work!

Name & Student ID: \_\_\_\_\_

Extra paper for problem 3.



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4. (a) (5 points) Evaluate the improper integral

$$\int_0^{\infty} \frac{1}{x^2 + 1} dx.$$

Show your work!

- (b) (5 points) Determine whether or not the improper integral

$$\int_5^{\infty} \frac{1}{(x^2 + 1)\ln(x)} dx$$

converges or diverges. Justify your answer.

Name & Student ID: \_\_\_\_\_

Extra paper for problem 4.