

Quiz 11

(4/16/20)

Name:

Drill Time:

TA name:

Directions: This is a take-home quiz. It should be turned in online through blackboard using GradeScope by 11:59pm on **Tuesday April 21**.

Write your solutions on another sheet of paper. The only resources you may use are notes, books, other students *in* the class, the TAs and your instructor. Any other resources (e.g., a friend on your floor, the Internet in general, etc.) are *prohibited* and constitute cheating. When caught you will be referred to the Academic Integrity Office. **You will be graded for completeness and correctness. Include all supporting work. Because you have a long time to complete this, late work will NOT be accepted.**

1. (1 points) Evaluate the following indefinite integral:  $\int x^{-1/3} dx$ .
2. (1 points) Give an expression representing all antiderivatives of  $f(x) = \frac{1}{1+x^2}$ .
3. (2 points) Evaluate the following indefinite integral.  $\int \frac{3}{x} + \csc^2 x dx$ . You should not use a computer/calculator for this. Instead, you should only use the rules in Ch. 4 Section 9 of the text book. **Include all steps.**
4. (2 points) Solve the initial value problem:  $h'(t) = e^t - t^2 + 1$  subject to  $h(0) = 3$ .
5. (2 points) Let  $f(x) = x^2 + 1$ . Compute a left Riemann sum over the interval  $[0, 2]$  with  $n = 4$ . Is this an over or under approximation of the area beneath the graph of  $x^2 + 1$ , above the  $x$ -axis and between  $y = 0$  and  $y = 2$ ?
6. (2 points) Using geometry, evaluate  $\int_0^3 f(x) dx$  given that

$$f(x) = \begin{cases} \sqrt{1-x^2} & 0 \leq x \leq 1 \\ x-1 & 1 < x \leq 3 \end{cases}.$$

Hint: Over  $[0, 1]$  the graph of  $f(x)$  looks like part of a circle.