Math 141, Exam 3
Practice Exam

Name: _____

Student ID: _____

Version: **A**

Instructions:

- Do NOT open exam booklet until instructed.
- Write your Name and Student ID Number on the lines above.
- Write your Name and Student ID Number on the answer sheet.
- Fill in version (A or B) on your answer sheet.
- No calculators, personal devices (phones, computers, tablets, etc.), or reference materials may be used during the exam.
- Indicate your answer to each question on the answer sheet by fully filling in the appropriate bubble.
- You may use any blank space on this exam booklet for your scratch work or ask for a blank sheet for scratch work. DO NOT USE YOUR OWN SCRATCH PAPER!
- The exam booklet and answer sheet will be collected at the end of the exam. Only the answer sheet will be graded.

1. If $\ln(x^5) = 3$, then

(a) $x = \frac{e^3}{5}$

(b) $x = e^{\frac{3}{5}}$

(c) $x = e^{15}$

(d) $x = \frac{\ln(3)}{5}$

2. Which of the following is an equation for the tangent line to $y = -e^{4x}$ at $x = 0$.

(a) $y = -4x - 4$

(b) $y = -x - 4$

(c) $y = -x + 1$

(d) $y = -4x - 1$

3. What is the derivative of $f(x) = 5\ln(2x)$?

(a) $f'(x) = \frac{5}{2x}$

(b) $f'(x) = \frac{5}{x}$

(c) $f'(x) = \frac{10}{x}$

(d) $f'(x) = 10\ln(x)$

4. Let $f(x) = e^{\sqrt{x^3+4}}$. Find $f'(x)$.

(a) $\frac{1}{2}e^{\sqrt{x^3+4}}(x^3+4)^{-1/2}$

(b) $e\sqrt{x^3+4}$

(c) $\frac{3}{2}x^2e^{\sqrt{x^3+4}}(x^3+4)^{-1/2}$

(d) $3x^2e^{\sqrt{x^3+4}}$

5. Compute $\frac{d}{dx}\frac{e^x}{\ln(x)}$.

(a) $\frac{e^x}{x}$

(b) $\frac{\frac{e^x}{x}-e^x\ln(x)}{(\ln(x))^2}$

(c) $\frac{e^x\ln(x)-\frac{e^x}{x}}{\ln(x^2)}$

(d) $\frac{e^x\left(\ln(x)-\frac{1}{x}\right)}{(\ln(x))^2}$

6. Which of the following statements about e^x is **false**? (Choose one.)

(a) The function e^x is its own derivative.

(b) The domain of $f(x)=e^x$ is all real numbers.

(c) e^x is positive for all real numbers.

(d) $\ln(e)=1$.

(e) The natural exponential has a relative maximum at $x=0$.

7. Find a function $A(t)$ satisfying $A'(t)=2A(t)$ and $A(0)=-1$.

(a) $A(t)=-e^{2t}$

(b) $A(t)=e^{2t}-1$

(c) $A(t)=e^{2t}-2$

(d) $A(t)=-2e^{2t}$

8. If $\int f(x)dx=2x^4+C$, what is $f(x)$?

(a) $\frac{8}{3}x^3$

(b) $8x^3$

(c) $2x^3$

(d) $8x^4$

9. Evaluating an **indefinite** integral produces

(a) a number.

(b) a single function.

(c) a set of functions.

10. Evaluating a **definite** integral produces

(a) a number.

(b) a single function.

(c) a set of functions.

11. Evaluate $\int 5x^4 + e^x dx$

(a) $x^5 + e^x$

(b) $x^5 + e^x + C$

(c) $20x^3 + e^x + C$

(d) $20x^3 + e^x$

12. Find $f(x)$ if $f'(x) = 7x^2 + 3x - 3$ and $f(0) = 1$.

(a) $\frac{7}{3}x^3 + \frac{3}{2}x^2 - 3x$

(b) $7x^3 + 3x^2 - 3x + 1$

(c) $\frac{7}{3}x^3 + \frac{3}{2}x^2 - 3x + 1$

(d) $\frac{7}{3}x^3 + \frac{3}{2}x^2 - 3x + C$

13. Evaluate $\int_1^2 \frac{5}{x} dx$.

(a) 5

(b) 10

(c) $5\ln(2)$

(d) $10\ln(\frac{1}{2})$

14. The area of the region bounded by the graphs of $g(x) = 2x + 1$ and $h(x) = x^2 + 1$ is represented by

(a) $\int_0^1 (2x+1) - (x^2+1)dx$

(b) $\int_0^2 (2x+1) - (x^2+1)dx$

(c) $\int_0^1 (x^2+1) - (2x+1)dx$

(d) $\int_0^2 (x^2+1) - (2x+1)dx$

15. The area under the graph of f from -4 to 5 where

$$f(x) = \begin{cases} 9 & x < 3 \\ x^2 & x \geq 3 \end{cases}$$

is represented by which of the following.

(a) $\int_{-4}^5 x^2 dx$

(b) $\int_{-4}^3 9dx + \int_3^5 x^2 dx$

(c) $\int_{-4}^3 x^2 dx + \int_3^5 9dx$

(d) it is impossible to integrate piecewise functions, to there is no solution

16. What is the average value of x^2 over the interval $[0, 2]$?

(a) $\frac{8}{3}$

(b) $\frac{8}{6}$

(c) $\frac{4}{3}$

(d) 4

17. Let $f(x)$ be a continuous function with continuous derivative. If $\int_1^5 f'(x)dx = 10$ and $f(1) = 2$, what is $f(5)$?

(a) 12

(b) 8

(c) 10

(d) There is not enough information to answer the question.

18. Evaluate $\int \frac{6x^2}{x^3-5}dx$.

(a) $6\ln|x^3 - 5| + C$

(b) $\frac{2}{(x^3-5)^2} + C$

(c) $2\ln|x^3 - 5| + C$

(d) $\frac{6x}{(x^3-5)^2} + C$

19. If $u = x - 3$, then

(a) $du = 1$

(b) $du = dx$

(c) $du = 3dx$

(d) $du = 3$

20. Compute $\int_3^4 (x-3)^{10}dx$

(a) $\frac{1}{11}$

(b) $\frac{1}{11}(4^{11} - 3^{11})$

(c) $(4^{10} - 3^{10})$

(d) 1