

Name: _____

This assignment consists of ten questions, each worth five points for a total of 50 points. To receive full credit you must **show all necessary work**. You should write your answers in the spaces provided, but if you require more space please *staple any extra sheets* you use to this assignment. If you are having trouble with any of the problems, look at the lecture notes and exercises in the lecture notes for help. Remember to start this assignment early, your next quiz is based on this assignment.

1. Find an antiderivative of the following functions:

(a) $u(x) = 10x^9 - 12x^3 - 5$

Answer: _____

(b) $v(x) = 4x^3 + 6x^2 - 7x + 3$

Answer: _____

(c) $w(x) = 3x^{1/2} + 2x^{2/3} + 4x^{-2} + 3x^{-1/2}$

Answer: _____

2. Find an antiderivative of the following functions:

(a) $u(x) = \frac{5}{x}$

Answer: _____

$$(b) v(x) = \frac{4}{x} + \frac{5}{x^2} + \frac{6}{x^3} + \frac{7}{x^4}$$

Answer: _____

$$(c) w(x) = \frac{9x^3 + 8x^2 + 3x - 4}{3x^3}$$

Answer: _____

3. Find an antiderivative of the following functions:

$$(a) u(x) = e^{2x} + 5e^{-4x} - 7e^{3x}$$

Answer: _____

$$(b) v(x) = e^{4x} - 2e^{-2x} + x^2 - 5$$

Answer: _____

$$(c) w(x) = \frac{1}{x^2} - e^{3x} + 21e^{-7x}$$

Answer: _____

4. Find the indefinite integral of the following functions:

(a) $u(x) = e^x + \frac{2}{x}$

Answer: _____

(b) $v(x) = \frac{1}{7x} + \frac{1}{e^{-x}} + \frac{1}{4z^8}$

Answer: _____

(c) $w(x) = e^{-x} (e^{2x} + e^x)$

Answer: _____

In questions 5-7, find functions $f(x)$ and $g(x)$ such that the given function takes the form $g'(x)f'(g(x))$. Afterwards, find the indefinite integral of the function.

5. $u(x) = 12x(7 + 6x^2)^9$

Answer: _____

6. $v(x) = (12x^3 - 36x)(x^4 - 6x^2)^2$

Answer: _____

7. $w(x) = 8x^2 (14 + 8x^2)^4$

Answer: _____

In questions 8-10, find functions $f(x)$ and $g(x)$ such that the given function takes the form $f'(x)g(x) + f(x)g'(x)$. Afterwards, find the indefinite integral of the function.

8. $u(x) = (3x^2 - 14x)e^x + (x^3 - 7x^2 + 1)e^x$

Answer: _____

9. $v(x) = (3x^2 + 5)(x^2 - 7x + 2) + (x^3 + 5x)(2x - 7)$

Answer: _____

10. $w(x) = 2x \ln(x) + x$

Answer: _____