

Student: _____
Date: _____

Instructor: Pangyen Weng
Course: Calculus II

Assignment: 1.1 Antiderivatives

1. Find an antiderivative for the function $f(x) = 12x^{11}$ when $C = 0$.

The antiderivative is .

2. Find an antiderivative for each function. Check your answers by differentiation.

(a) $g(x) = \frac{1}{x^8}$

(b) $h(x) = \frac{6}{x^8}$

(c) $k(x) = 5 - \frac{6}{x^8}$

(a) $G(x) =$

(Use C as the arbitrary constant.)

(b) $H(x) =$

(Use C as the arbitrary constant.)

(c) $K(x) =$

(Use C as the arbitrary constant.)

3. Find the antiderivative of the function $f(x) = 9 \csc x \cot x$ when $C = 0$.

The antiderivative is .

4. Find an antiderivative for each function when $C = 0$.

a. $f(x) = e^{10x}$ b. $g(x) = e^{-4x}$ c. $h(x) = e^{x/3}$

a. The antiderivative of e^{10x} is .

b. The antiderivative of e^{-4x} is .

c. The antiderivative of $e^{x/3}$ is .

5. Find the indefinite integral $\int (10x + 7)dx$.

$\int (10x + 7)dx =$

(Use C as an arbitrary constant.)

6. Find the indefinite integral $\int \left(\frac{1}{x^{10}} - x^{10} - \frac{1}{5} \right) dx$.

$\int \left(\frac{1}{x^{10}} - x^{10} - \frac{1}{5} \right) dx =$

(Use C as an arbitrary constant.)

7. Find the most general antiderivative or indefinite integral. Check your answer by differentiation.

$$\int (-6 \csc^2 x) \, dx$$

$$\int (-6 \csc^2 x) \, dx = \boxed{}$$

(Use C as the arbitrary constant.)

8. Evaluate the integral.

$$\int (e^{3x} + 7e^{-x}) \, dx$$

$$\int (e^{3x} + 7e^{-x}) \, dx = \boxed{} \text{ (Use C as the arbitrary constant.)}$$

9. Find the function $y(x)$ satisfying $\frac{dy}{dx} = 5x^{-6/7}$ and $y(-1) = -7$.
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The function $y(x)$ satisfying $\frac{dy}{dx} = 5x^{-6/7}$ and $y(-1) = -7$ is $y(x) = \boxed{}$.

10. Find the function $s(t)$ satisfying $\frac{ds}{dt} = -2 + 5 \cos t$ and $s(0) = 4$.
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The function $s(t)$ satisfying $\frac{ds}{dt} = -2 + 5 \cos t$ and $s(0) = 4$ is $\boxed{}$.

1. x^{12}

2. $-\frac{1}{7x^7} + C$

$-\frac{6}{7x^7} + C$

$5x + \frac{6}{7x^7} + C$

3. $-9 \csc x$

4. $\frac{1}{10} e^{10x}$

$-\frac{1}{4} e^{-4x}$

$3e^{x/3}$

5. $5x^2 + 7x + C$

6. $-\frac{1}{9x^9} - \frac{x^{11}}{11} - \frac{x}{5} + C$

7. $6 \cot x + C$

8. $\frac{1}{3} e^{3x} - 7e^{-x} + C$

9. $35x^{1/7} + 28$

10. $-2t + 5 \sin t + 4$
