

Student: _____
Date: _____

Instructor: Pangyen Weng
Course: Calculus II

Assignment: 1.6 The Substitution
 Method

1. Evaluate the following indefinite integral by using the given substitution to reduce the integral to standard form.

$$\int 2(2x + 4)^8 dx, u = 2x + 4$$

$$\int 2(2x + 4)^8 dx = \boxed{}$$

(Use C as the arbitrary constant.)

2. Evaluate the indefinite integral by using the given substitution to reduce the integral to standard form.

$$\int \frac{16t^3 dt}{\sqrt{3-t^4}}, u = 3 - t^4$$

$$\int \frac{16t^3 dt}{\sqrt{3-t^4}} = \boxed{}$$

(Use C as the arbitrary constant.)

3. Evaluate the integral.

$$\int \frac{3}{\sqrt{x} (8 + 3\sqrt{x})^3} dx$$

$$\int \frac{3}{\sqrt{x} (8 + 3\sqrt{x})^3} dx = \boxed{}$$

(Use C as the arbitrary constant.)

4. Evaluate the integral $\int \sin^6 \frac{x}{6} \cos \frac{x}{6} dx$.

$$\int \sin^6 \frac{x}{6} \cos \frac{x}{6} dx = \boxed{}$$

(Use C as the arbitrary constant.)

5. Evaluate the integral $\int \frac{4}{t^5} \cos \left(\frac{1}{t^4} - 1 \right) dt$.

$$\int \frac{4}{t^5} \cos \left(\frac{1}{t^4} - 1 \right) dt = \boxed{}$$

(Use C as the arbitrary constant.)

6. Find the indefinite integral.

$$\int \frac{x}{\sqrt{x+9}} dx$$

$$\int \frac{x}{\sqrt{x+9}} dx = \boxed{}$$

(Use C as the arbitrary constant.)

7. Evaluate the integral $\int x^3 \sqrt{x^2 + 2} dx$.

$$\int x^3 \sqrt{x^2 + 2} dx = \boxed{}$$

(Use C as the arbitrary constant.)

8. Find the indefinite integral.

$$\int \frac{x^2}{(3-x^3)^2} dx$$

$$\int \frac{x^2}{(3-x^3)^2} dx = \boxed{}$$

(Use C as the arbitrary constant.)

9. Evaluate the integral $\int r^2 \left(\frac{r^3}{9} - 9 \right)^2 dr$.

$$\int r^2 \left(\frac{r^3}{9} - 9 \right)^2 dr = \boxed{}$$

(Use C as an arbitrary constant.)

10. Evaluate the integral $\int \frac{5}{(5x+2) \ln(5x+2)} dx$.

$$\int \frac{5}{(5x+2) \ln(5x+2)} dx = \boxed{}$$

(Use C as the arbitrary constant.)

1. $\frac{1}{9}(2x+4)^9 + C$

2. $-8(3-t^4)^{1/2} + C$

3. $-\frac{1}{(8+3\sqrt{x})^2} + C$

4. $\frac{6}{7} \sin^7 \frac{x}{6} + C$

5. $-\sin\left(\frac{1}{t^4} - 1\right) + C$

6. $\frac{2}{3}(x+9)^{\frac{3}{2}} - 18(x+9)^{\frac{1}{2}} + C$

7. $\frac{1}{5}(x^2+2)^{\frac{5}{2}} - \frac{2}{3}(x^2+2)^{\frac{3}{2}} + C$

8. $\frac{1}{3}(3-x^3)^{-1} + C$

9. $\left(\frac{r^3}{9} - 9\right)^3 + C$

10. $\ln |\ln(5x+2)| + C$
