

Unit 5 Test (Part 1)

REVIEW

- Integration Rules
 - Power Rule (WS 1)**
 - U-Substitution (WS 2)**
 - Case 1: Algebraic Quantity to a Power**
 - Trig Functions (WS 4)**
 - Case 2: Raised to a Power**
 - Case 3: Unusual Angles**
 - Implicit Derivatives (WS 5)**
- Eliminating the Constant (C=?) (WS 3&5)

#1. Evaluate the integral.

$$\int 2 \cos^5 x \sin x \, dx$$

#2. Find the antiderivative whose graph goes through the given point.

$$\int (8x^3 + 3x^2 - 4x) dx \quad (1,6)$$

#3. Evaluate the following using an implicit integral.

$$\frac{dy}{dx} = \frac{12x^3}{2y}$$

#4. Find the original function for the given second derivative and initial conditions.

$$f''(x) = 3x + 8$$

given:

$$f'(2) = 19 \text{ and } f(4) = 88$$

#5. Evaluate the integral.

$$\int 2x(5x^2 - 6)^5 dx$$

#6. Find the Antiderivative.

$$f(x) = \sqrt[4]{x} + 2\sqrt[3]{x^2} - 6\sqrt{x} + 3$$

#7. Evaluate the integral.

$$\int 8x \sin(2x^2) dx$$

#8. Find the antiderivative whose graph goes through the given point.

$$\int \frac{6}{\sqrt{3x+1}} dx \quad (1,8)$$

#9. Find the position function for the given acceleration function and initial conditions.

$$a(t) = 4t + 2$$

given :

$$v(2) = 17 \text{ and } s(1) = 7$$

#10. Evaluate the implicit integral that passes through the given point.

$$\frac{dy}{dx} = \frac{1}{2x^2 y} \quad (2,2)$$

#11. Evaluate the integral.

$$\int x^2 \cos^5(x^3) \sin(x^3) dx$$

SOLUTIONS

$$1. \quad F(x) = -\frac{\cos^6 x}{3} + C$$

$$2. \quad F(x) = 2x^4 + x^3 - 2x^2 + 5$$

$$3. \quad y = \pm\sqrt{3x^4 + C}$$

$$4. \quad F(x) = \frac{x^3}{2} + 4x^2 - 3x + 4$$

$$5. \quad F(x) = \frac{(5x^2 - 6)^6}{30} + C$$

$$6. \quad F(x) = \frac{4}{5}\sqrt[4]{x^5} + \frac{6}{5}\sqrt[3]{x^5} - 4\sqrt{x^3} + 3x + C$$

$$7. \quad F(x) = -2\cos(2x^2) + C$$

$$8. \quad F(x) = 4\sqrt{3x + 1}$$

$$9. \quad s(t) = \frac{2t^3}{3} + t^2 + 5t + \frac{1}{3}$$

$$10. \quad y = \sqrt{-\frac{1}{x} + \frac{9}{2}}$$

$$11. \quad F(x) = -\frac{\cos^6(x^3)}{18} + C$$