

Calculus Practice: Techniques for Finding Antiderivatives 1a

Evaluate each indefinite integral. Use the provided substitution.

1) $\int 40x^4(2x^5 + 1)^4 dx; u = 2x^5 + 1$

A) $\frac{4}{5}(2x^5 + 1)^5 + C$

B) $\frac{5}{6}(2x^5 + 1)^6 + C$

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

D) $(2x^5 + 1)^5 + C$

2) $\int (4x^5 - 1)^5 \cdot 40x^4 dx; u = 4x^5 - 1$

A) $(4x^5 - 1)^4 + C$

B) $\frac{2}{5}(4x^5 - 1)^5 + C$

C) $(4x^5 - 1)^5 + C$

D) $\frac{1}{3}(4x^5 - 1)^6 + C$

3) $\int (x - 1)^3 \cdot 5x dx; u = x - 1$

A) $\frac{1}{7}(x - 1)^7 + \frac{1}{6}(x - 1)^6 + C$

B) $\frac{3}{5}(x - 1)^5 + \frac{3}{4}(x - 1)^4 + C$

C) $\frac{4}{7}(x - 1)^7 + \frac{2}{3}(x - 1)^6 + C$

D) $(x - 1)^5 + \frac{5}{4}(x - 1)^4 + C$

4) $\int (x + 3)^4 \cdot x dx; u = x + 3$

A) $\frac{3}{5}(x + 3)^5 - \frac{9}{4}(x + 3)^4 + C$

B) $\frac{1}{6}(x + 3)^6 - \frac{3}{5}(x + 3)^5 + C$

C) $\frac{5}{7}(x + 3)^7 - \frac{5}{2}(x + 3)^6 + C$

D) $\frac{4}{5}(x + 3)^5 - 3(x + 3)^4 + C$

5) $\int \frac{40x^4}{(2x^5 + 3)^3} dx; u = 2x^5 + 3$

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

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

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

D) $-\frac{5}{4(2x^5 + 3)^4} + C$

6) $\int \frac{80x^3}{(5x^4 - 2)^4} dx; u = 5x^4 - 2$

A) $-\frac{2}{3(5x^4 - 2)^3} + C$

B) $-\frac{5}{3(5x^4 - 2)^3} + C$

C) $-\frac{4}{3(5x^4 - 2)^3} + C$

D) $-\frac{1}{2(5x^4 - 2)^4} + C$

$$7) \int \frac{2x}{(3x-1)^4} dx; u = 3x-1$$

- A) $-\frac{1}{9(3x-1)^2} - \frac{2}{27(3x-1)^3} + C$
 B) $-\frac{5}{27(3x-1)^3} - \frac{5}{36(3x-1)^4} + C$
 C) $-\frac{5}{18(3x-1)^2} - \frac{5}{27(3x-1)^3} + C$
 D) $-\frac{1}{9(3x-1)^3} - \frac{1}{12(3x-1)^4} + C$

$$8) \int \frac{5x}{(x-1)^5} dx; u = x-1$$

- A) $-\frac{1}{3(x-1)^3} - \frac{1}{4(x-1)^4} + C$
 B) $-\frac{5}{3(x-1)^3} - \frac{5}{4(x-1)^4} + C$
 C) $-\frac{1}{(x-1)^3} - \frac{3}{4(x-1)^4} + C$
 D) $-\frac{2}{3(x-1)^3} - \frac{1}{2(x-1)^4} + C$

$$9) \int 9x^2 \sqrt{x^3-3} dx; u = x^3-3$$

- A) $\frac{4}{3}(x^3-3)^{\frac{3}{2}} + C$
 B) $\frac{15}{4}(x^3-3)^{\frac{4}{3}} + C$
 C) $2(x^3-3)^{\frac{3}{2}} + C$
 D) $\frac{8}{3}(x^3-3)^{\frac{3}{2}} + C$

$$10) \int 12x^3 \sqrt{x^4+5} dx; u = x^4+5$$

- A) $\frac{4}{3}(x^4+5)^{\frac{3}{2}} + C$
 B) $\frac{10}{3}(x^4+5)^{\frac{3}{2}} + C$
 C) $2(x^4+5)^{\frac{3}{2}} + C$
 D) $\frac{15}{4}(x^4+5)^{\frac{4}{3}} + C$

$$11) \int x(3x-2)^{\frac{1}{5}} dx; u = 3x-2$$

- A) $\frac{2}{21}(3x-2)^{\frac{7}{3}} + \frac{1}{3}(3x-2)^{\frac{4}{3}} + C$
 B) $\frac{4}{21}(3x-2)^{\frac{7}{3}} + \frac{2}{3}(3x-2)^{\frac{4}{3}} + C$
 C) $\frac{20}{99}(3x-2)^{\frac{11}{5}} + \frac{20}{27}(3x-2)^{\frac{6}{5}} + C$
 D) $\frac{5}{99}(3x-2)^{\frac{11}{5}} + \frac{5}{27}(3x-2)^{\frac{6}{5}} + C$

$$12) \int 2x \sqrt[3]{x-4} dx; u = x-4$$

- A) $\frac{2}{5}(x-4)^{\frac{5}{2}} + \frac{8}{3}(x-4)^{\frac{3}{2}} + C$
 B) $\frac{12}{7}(x-4)^{\frac{7}{3}} + 12(x-4)^{\frac{4}{3}} + C$
 C) $2(x-4)^{\frac{5}{2}} + \frac{40}{3}(x-4)^{\frac{3}{2}} + C$
 D) $\frac{6}{7}(x-4)^{\frac{7}{3}} + 6(x-4)^{\frac{4}{3}} + C$

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