Calculus Practice: Techniques for Finding Antiderivatives 17a

Express each definite integral in terms of *u*, but do not evaluate.

1) $\int_{-1}^{0} -4x(x^2-1)^4\,dx;\ u = x^2 - 1$

A) $\int_{0}^{6} -2u^4\,du$ B) $\int_{0}^{-3} -2u^4\,du$

C) $\int_{2}^{-5} -2u^4\,du$ D) $\int_{0}^{-1} -2u^4\,du$

2) $\int_{-1}^{0} 9x^2(3x^3+3)^2\,dx;\ u = 3x^3 + 3$

A) $\int_{0}^{3} u^2\,du$ B) $\int_{2}^{8} u^2\,du$

C) $\int_{-3}^{-5} u^2\,du$ D) $\int_{1}^{3} u^2\,du$

3) $\int_{-1}^{1} 6x(3x^2-2)^3\,dx;\ u = 3x^2 - 2$

A) $\int_{1}^{1} u^3\,du$ B) $\int_{1}^{-3} u^3\,du$

C) $\int_{-2}^{0} u^3\,du$ D) $\int_{1}^{8} u^3\,du$

4) $\int_{-1}^{1} 6x(x^2-1)^4\,dx;\ u = x^2 - 1$

A) $\int_{-2}^{0} 3u^4\,du$ B) $\int_{4}^{0} 3u^4\,du$

C) $\int_{8}^{-10} 3u^4\,du$ D) $\int_{0}^{0} 3u^4\,du$

5) $\int_{1}^{3} -\frac{16x}{(4x^2+4)^2}\,dx;\ u = 4x^2 + 4$

A) $\int_{8}^{31} -\frac{2}{u^2}\,du$ B) $\int_{8}^{40} -\frac{2}{u^2}\,du$

C) $\int_{17}^{40} -\frac{2}{u^2}\,du$ D) $\int_{8}^{48} -\frac{2}{u^2}\,du$

6) $\int_{-1}^{1} \frac{8x}{(2x^2+2)^4}\,dx;\ u = 2x^2 + 2$

A) $\int_{4}^{4} \frac{2}{u^4}\,du$ B) $\int_{4}^{-1} \frac{2}{u^4}\,du$

C) $\int_{7}^{-3} \frac{2}{u^4}\,du$ D) $\int_{7}^{4} \frac{2}{u^4}\,du$

7) $\int_{0}^{2} \frac{4x}{(x^2+1)^2}\,dx;\ u = x^2 + 1$

A) $\int_{1}^{5} \frac{2}{u^2}\,du$ B) $\int_{1}^{11} \frac{2}{u^2}\,du$

C) $\int_{-1}^{5} \frac{2}{u^2}\,du$ D) $\int_{1}^{0} \frac{2}{u^2}\,du$

8) $\int_{-1}^{1} -\frac{8x}{(4x^2+5)^2}\,dx;\ u = 4x^2 + 5$

A) $\int_{17}^{9} -\frac{1}{u^2}\,du$ B) $\int_{13}^{9} -\frac{1}{u^2}\,du$

C) $\int_{12}^{0} -\frac{1}{u^2}\,du$ D) $\int_{9}^{9} -\frac{1}{u^2}\,du$

Evaluate each definite integral.

9) $\int_{-1}^{2} -6x(x^2 - 4)^2 \, dx$

A) -37 B) -27
C) -34 D) -30

10) $\int_{-1}^{1} -4x(2x^2 - 3)^3 \, dx$

A) 4 B) -6
C) 7 D) 0

11) $\int_{0}^{1} -9x^2(3x^3 + 1)^2 \, dx$

A) -16 B) -12
C) -21 D) -13

12) $\int_{-1}^{0} -6x(3x^2 - 3)^2 \, dx$

A) 19 B) 4
C) 13 D) 9

13) $\int_{-1}^{1} 3x^2(x^3 + 2)^3 \, dx$

A) 10 B) 20
C) 19 D) 26

14) $\int_{-1}^{1} 24x(4x^2 - 4)^3 \, dx$

A) 1 B) 3
C) -2 D) 0

15) $\int_{-1}^{1} \frac{24x}{(4x^2 + 2)^2} \, dx$

A) 1 B) -10
C) 0 D) -5

16) $\int_{-1}^{1} \frac{4x}{(2x^2 + 2)^2} \, dx$

A) -2 B) 0
C) 7 D) -10

17) $\int_{-2}^{0} \frac{4x}{(2x^2 + 1)^2} \, dx$

A) -8
B) $-\frac{8}{11} \approx -0.727$
C) $-\frac{8}{3} \approx -2.667$
D) $-\frac{8}{9} \approx -0.889$

18) $\int_{0}^{2} -\frac{4x}{(2x^2 + 1)^2} \, dx$

A) $-\frac{12}{19} \approx -0.632$
B) $-\frac{8}{9} \approx -0.889$
C) -4
D) $-\frac{8}{13} \approx -0.615$

19) $\int_{-3}^{0} -\frac{4x}{(2x^2 + 3)^2} \, dx$

A) $\frac{6}{7} \approx 0.857$ B) $-\frac{1}{7} \approx -0.143$
C) $\frac{1}{7} \approx 0.143$ D) $\frac{2}{7} \approx 0.286$

20) $\int_{0}^{1} \frac{12x}{(2x^2 + 4)^2} \, dx$

A) $\frac{1}{12} \approx 0.083$ B) $\frac{1}{4} = 0.25$
C) $-\frac{7}{4} = -1.75$ D) $\frac{1}{11} \approx 0.091$

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