Name_____

Calculus Practice: Techniques for Finding Antiderivatives 1b

Evaluate each indefinite integral. Use the provided substitution.

1) $\int (5x^5 + 3)^5 \cdot 125x^4 \, dx; \quad u = 5x^5 + 3$

2) $\int (x^2 + 4)^5 \cdot 4x \, dx; \quad u = x^2 + 4$

3) $\int 45x^2(3x^3 - 5)^5 \, dx; \quad u = 3x^3 - 5$

4) $\int 100x^4(4x^5 - 1)^4 \, dx; \quad u = 4x^5 - 1$

5) $\int (2x - 5)^3 \cdot 3x \, dx; \quad u = 2x - 5$

6) $\int (3x + 5)^4 \cdot 4x \, dx; \quad u = 3x + 5$

7) $\int x(5x - 4)^4 \, dx; \quad u = 5x - 4$

8) $\int 3x(x + 3)^5 \, dx; \quad u = x + 3$

9) $\int (5x^4 + 4)^{-4} \cdot 60x^3 \, dx; \quad u = 5x^4 + 4$

10) $\int (2x^4 + 3)^{-3} \cdot 40x^3 \, dx; \quad u = 2x^4 + 3$

11) $\displaystyle\int \frac{45x^4}{(3x^5+2)^3}\,dx;\ u=3x^5+2$

12) $\displaystyle\int (4x-3)^{-4}\cdot 3x\,dx;\ u=4x-3$

13) $\displaystyle\int \frac{2x}{(x+3)^4}\,dx;\ u=x+3$

14) $\displaystyle\int \frac{4x}{(2x+5)^4}\,dx;\ u=2x+5$

15) $\displaystyle\int 16x\sqrt[3]{2x^2+1}\,dx;\ u=2x^2+1$

16) $\displaystyle\int 25x^4(x^5-3)^{\frac{3}{2}}\,dx;\ u=x^5-3$

17) $\displaystyle\int 20x^4(x^5+5)^{\frac{1}{2}}\,dx;\ u=x^5+5$

18) $\displaystyle\int (2x-1)^{\frac{1}{4}}\cdot 5x\,dx;\ u=2x-1$

19) $\displaystyle\int (3x-5)^{\frac{1}{3}}\cdot 2x\,dx;\ u=3x-5$

20) $\displaystyle\int 2x\sqrt[3]{3x-2}\,dx;\ u=3x-2$

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Calculus Practice: Techniques for Finding Antiderivatives 1b

Evaluate each indefinite integral. Use the provided substitution.

1) $\int (5x^5 + 3)^5 \cdot 125x^4 \, dx; \ u = 5x^5 + 3$

$\dfrac{5}{6}(5x^5 + 3)^6 + C$

2) $\int (x^2 + 4)^5 \cdot 4x \, dx; \ u = x^2 + 4$

$\dfrac{1}{3}(x^2 + 4)^6 + C$

3) $\int 45x^2(3x^3 - 5)^5 \, dx; \ u = 3x^3 - 5$

$\dfrac{5}{6}(3x^3 - 5)^6 + C$

4) $\int 100x^4(4x^5 - 1)^4 \, dx; \ u = 4x^5 - 1$

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

5) $\int (2x - 5)^3 \cdot 3x \, dx; \ u = 2x - 5$

$\dfrac{3}{20}(2x - 5)^5 + \dfrac{15}{16}(2x - 5)^4 + C$

6) $\int (3x + 5)^4 \cdot 4x \, dx; \ u = 3x + 5$

$\dfrac{2}{27}(3x + 5)^6 - \dfrac{4}{9}(3x + 5)^5 + C$

7) $\int x(5x - 4)^4 \, dx; \ u = 5x - 4$

$\dfrac{1}{150}(5x - 4)^6 + \dfrac{4}{125}(5x - 4)^5 + C$

8) $\int 3x(x + 3)^5 \, dx; \ u = x + 3$

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

9) $\int (5x^4 + 4)^{-4} \cdot 60x^3 \, dx; \ u = 5x^4 + 4$

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

10) $\int (2x^4 + 3)^{-3} \cdot 40x^3 \, dx; \ u = 2x^4 + 3$

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

11) $\int \dfrac{45x^4}{(3x^5 + 2)^3}\, dx;\ \ u = 3x^5 + 2$

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

12) $\int (4x - 3)^{-4} \cdot 3x\, dx;\ \ u = 4x - 3$

$\qquad -\dfrac{3}{32(4x - 3)^2} - \dfrac{3}{16(4x - 3)^3} + C$

13) $\int \dfrac{2x}{(x + 3)^4}\, dx;\ \ u = x + 3$

$\qquad -\dfrac{1}{(x + 3)^2} + \dfrac{2}{(x + 3)^3} + C$

14) $\int \dfrac{4x}{(2x + 5)^4}\, dx;\ \ u = 2x + 5$

$\qquad -\dfrac{1}{2(2x + 5)^2} + \dfrac{5}{3(2x + 5)^3} + C$

15) $\int 16x\sqrt[3]{2x^2 + 1}\, dx;\ \ u = 2x^2 + 1$

$\qquad 3(2x^2 + 1)^{\frac{4}{3}} + C$

16) $\int 25x^4(x^5 - 3)^{\frac{3}{2}}\, dx;\ \ u = x^5 - 3$

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

17) $\int 20x^4(x^5 + 5)^{\frac{1}{2}}\, dx;\ \ u = x^5 + 5$

$\qquad \dfrac{8}{3}(x^5 + 5)^{\frac{3}{2}} + C$

18) $\int (2x - 1)^{\frac{1}{4}} \cdot 5x\, dx;\ \ u = 2x - 1$

$\qquad \dfrac{5}{9}(2x - 1)^{\frac{9}{4}} + (2x - 1)^{\frac{5}{4}} + C$

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

$\qquad \dfrac{2}{21}(3x - 5)^{\frac{7}{3}} + \dfrac{5}{6}(3x - 5)^{\frac{4}{3}} + C$

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

$\qquad \dfrac{2}{21}(3x - 2)^{\frac{7}{3}} + \dfrac{1}{3}(3x - 2)^{\frac{4}{3}} + C$