Calculus Practice: Techniques for Finding Antiderivatives 13b

Evaluate each indefinite integral. Use the provided substitution.

1) $\int \frac{6x}{3x^2\sqrt{9x^4 - 1}}\, dx;\ u = 3x^2$

2) $\int \frac{5x^4}{25 + x^{10}}\, dx;\ u = x^5$

3) $\int \frac{9x^2}{3x^3\sqrt{9x^6 - 4}}\, dx;\ u = 3x^3$

4) $\int \frac{2x}{x^2\sqrt{x^4 - 4}}\, dx;\ u = x^2$

5) $\int \frac{25x^4}{5x^5\sqrt{25x^{10} - 9}}\, dx;\ u = 5x^5$

6) $\int \frac{25x^4}{\sqrt{9 - 25x^{10}}}\, dx;\ u = 5x^5$

7) $\int \frac{25x^4}{\sqrt{25 - 25x^{10}}}\, dx;\ u = 5x^5$

8) $\int \frac{20x^3}{\sqrt{16 - 25x^8}}\, dx;\ u = 5x^4$

9) $\int \frac{6x}{\sqrt{16 - 9x^4}}\, dx;\ u = 3x^2$

10) $\int \frac{15x^4}{\sqrt{16 - 9x^{10}}}\, dx;\ u = 3x^5$

11) $\int \frac{4x}{2x^2\sqrt{4x^4 - 25}}\, dx;\ u = 2x^2$

12) $\int \frac{5x^4}{x^5\sqrt{x^{10} - 25}}\, dx;\ u = x^5$

13) $\int \frac{15x^2}{1 + 25x^6}\, dx;\ u = 5x^3$

14) $\int \frac{16x^3}{4x^4\sqrt{16x^8 - 16}}\, dx;\ u = 4x^4$

15) $\int \frac{12x^3}{3x^4\sqrt{9x^8 - 1}}\, dx;\ u = 3x^4$

16) $\int \frac{4x^3}{16 + x^8}\, dx;\ u = x^4$

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Evaluate each indefinite integral. Use the provided substitution.

1) $\int \frac{6x}{3x^2\sqrt{9x^4 - 1}}\,dx;\ u = 3x^2$

$\sec^{-1}\left|3x^2\right| + C$

2) $\int \frac{5x^4}{25 + x^{10}}\,dx;\ u = x^5$

$\frac{1}{5}\cdot\tan^{-1}\frac{x^5}{5} + C$

3) $\int \frac{9x^2}{3x^3\sqrt{9x^6 - 4}}\,dx;\ u = 3x^3$

$\frac{1}{2}\cdot\sec^{-1}\frac{\left|3x^3\right|}{2} + C$

4) $\int \frac{2x}{x^2\sqrt{x^4 - 4}}\,dx;\ u = x^2$

$\frac{1}{2}\cdot\sec^{-1}\frac{\left|x^2\right|}{2} + C$

5) $\int \frac{25x^4}{5x^5\sqrt{25x^{10} - 9}}\,dx;\ u = 5x^5$

$\frac{1}{3}\cdot\sec^{-1}\frac{\left|5x^5\right|}{3} + C$

6) $\int \frac{25x^4}{\sqrt{9 - 25x^{10}}}\,dx;\ u = 5x^5$

$\sin^{-1}\frac{5x^5}{3} + C$

7) $\int \frac{25x^4}{\sqrt{25 - 25x^{10}}}\,dx;\ u = 5x^5$

$\sin^{-1}\frac{5x^5}{5} + C$

8) $\int \frac{20x^3}{\sqrt{16 - 25x^8}}\,dx;\ u = 5x^4$

$\sin^{-1}\frac{5x^4}{4} + C$

9) $\int \frac{6x}{\sqrt{16 - 9x^4}}\,dx;\ u = 3x^2$

$\sin^{-1} \frac{3x^2}{4} + C$

10) $\int \frac{15x^4}{\sqrt{16 - 9x^{10}}}\,dx;\ u = 3x^5$

$\sin^{-1} \frac{3x^5}{4} + C$

11) $\int \frac{4x}{2x^2\sqrt{4x^4 - 25}}\,dx;\ u = 2x^2$

$\frac{1}{5} \cdot \sec^{-1} \frac{\left|2x^2\right|}{5} + C$

12) $\int \frac{5x^4}{x^5\sqrt{x^{10} - 25}}\,dx;\ u = x^5$

$\frac{1}{5} \cdot \sec^{-1} \frac{\left|x^5\right|}{5} + C$

13) $\int \frac{15x^2}{1 + 25x^6}\,dx;\ u = 5x^3$

$\tan^{-1} 5x^3 + C$

14) $\int \frac{16x^3}{4x^4\sqrt{16x^8 - 16}}\,dx;\ u = 4x^4$

$\frac{1}{4} \cdot \sec^{-1} \frac{\left|4x^4\right|}{4} + C$

15) $\int \frac{12x^3}{3x^4\sqrt{9x^8 - 1}}\,dx;\ u = 3x^4$

$\sec^{-1} \left|3x^4\right| + C$

16) $\int \frac{4x^3}{16 + x^8}\,dx;\ u = x^4$

$\frac{1}{4} \cdot \tan^{-1} \frac{x^4}{4} + C$