# Calculus Practice 3.3B5: Techniques for Finding Antiderivatives 13a

**Evaluate each indefinite integral. Use the provided substitution.**

1) $\displaystyle\int \frac{6x}{3x^2\sqrt{9x^4-25}}\,dx;\ u = 3x^2$

A) $\dfrac{1}{5}\cdot\sec^{-1}\dfrac{\left|3x^2\right|}{5}+C$

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

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

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

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

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

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

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

D) $\dfrac{1}{2}\cdot\tan^{-1}\dfrac{3x^3}{2}+C$

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

A) $\sin^{-1}\dfrac{x^4}{4}+C$

B) $\dfrac{1}{4}\cdot\tan^{-1}\dfrac{x^4}{4}+C$

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

D) $\sin^{-1}\dfrac{x^4}{2}+C$

4) $\displaystyle\int \frac{20x^4}{1+16x^{10}}\,dx;\ u = 4x^5$

A) $\dfrac{1}{2}\cdot\sec^{-1}\dfrac{\left|4x^5\right|}{2}+C$

B) $\tan^{-1}4x^5+C$

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

D) $\dfrac{1}{4}\cdot\sec^{-1}\dfrac{\left|4x^5\right|}{4}+C$

5) $\displaystyle\int \frac{20x^4}{\sqrt{1-16x^{10}}}\,dx;\ u = 4x^5$

A) $\dfrac{1}{3}\cdot\sec^{-1}\dfrac{\left|4x^5\right|}{3}+C$

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

C) $\sec^{-1}\left|4x^5\right|+C$

D) $\dfrac{1}{3}\cdot\tan^{-1}\dfrac{4x^5}{3}+C$

6) $\displaystyle\int \frac{15x^2}{5x^3\sqrt{25x^6-9}}\,dx;\ u = 5x^3$

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

B) $\dfrac{1}{2}\cdot\sec^{-1}\dfrac{\left|5x^3\right|}{2}+C$

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

D) $\dfrac{1}{4}\cdot\sec^{-1}\dfrac{\left|5x^3\right|}{4}+C$

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

A) $\sin^{-1}\dfrac{3x^2}{4}+C$

B) $\dfrac{1}{3}\cdot\tan^{-1}\dfrac{3x^2}{3}+C$

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

D) $\dfrac{1}{4}\cdot\sec^{-1}\dfrac{\left|3x^2\right|}{4}+C$

8) $\displaystyle\int \frac{8x}{25+16x^4}\,dx;\ u = 4x^2$

A) $\dfrac{1}{4}\cdot\sec^{-1}\dfrac{\left|4x^2\right|}{4}+C$

B) $\dfrac{1}{5}\cdot\tan^{-1}\dfrac{4x^2}{5}+C$

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

D) $\dfrac{1}{5}\cdot\sec^{-1}\dfrac{\left|4x^2\right|}{5}+C$

9) $\displaystyle\int \frac{10x^4}{2x^5\sqrt{4x^{10}-25}}\,dx;\ \ u = 2x^5$

A) $\sin^{-1}\dfrac{2x^5}{3} + C$

B) $\dfrac{1}{3}\cdot\tan^{-1}\dfrac{2x^5}{3} + C$

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

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

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

A) $\dfrac{1}{2}\cdot\tan^{-1}\dfrac{x^4}{2} + C$

B) $\sin^{-1}\dfrac{x^4}{5} + C$

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

D) $\tan^{-1} x^4 + C$

11) $\displaystyle\int \frac{20x^3}{1+25x^8}\,dx;\ \ u = 5x^4$

A) $\dfrac{1}{5}\cdot\sec^{-1}\dfrac{\left|5x^4\right|}{5} + C$

B) $\sin^{-1}\dfrac{5x^4}{2} + C$

C) $\dfrac{1}{4}\cdot\tan^{-1}\dfrac{5x^4}{4} + C$

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

12) $\displaystyle\int \frac{6x^2}{16+4x^6}\,dx;\ \ u = 2x^3$

A) $\dfrac{1}{3}\cdot\tan^{-1}\dfrac{2x^3}{3} + C$

B) $\sin^{-1}\dfrac{2x^3}{4} + C$

C) $\dfrac{1}{4}\cdot\tan^{-1}\dfrac{2x^3}{4} + C$

D) $\sin^{-1}\dfrac{2x^3}{5} + C$

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

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

B) $\sec^{-1}\left|x^5\right| + C$

C) $\dfrac{1}{2}\cdot\tan^{-1}\dfrac{x^5}{2} + C$

D) $\sin^{-1}\dfrac{x^5}{4} + C$

14) $\displaystyle\int \frac{8x^3}{4+4x^8}\,dx;\ \ u = 2x^4$

A) $\dfrac{1}{5}\cdot\sec^{-1}\dfrac{\left|2x^4\right|}{5} + C$

B) $\dfrac{1}{3}\cdot\sec^{-1}\dfrac{\left|2x^4\right|}{3} + C$

C) $\dfrac{1}{2}\cdot\tan^{-1}\dfrac{2x^4}{2} + C$

D) $\dfrac{1}{3}\cdot\tan^{-1}\dfrac{2x^4}{3} + C$

15) $\displaystyle\int \frac{20x^3}{4+25x^8}\,dx;\ \ u = 5x^4$

A) $\sin^{-1}\dfrac{5x^4}{2} + C$

B) $\sec^{-1}\left|5x^4\right| + C$

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

D) $\dfrac{1}{2}\cdot\tan^{-1}\dfrac{5x^4}{2} + C$

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

A) $\sin^{-1}\dfrac{x^5}{2} + C$

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

C) $\dfrac{1}{4}\cdot\sec^{-1}\dfrac{\left|x^5\right|}{4} + C$

D) $\dfrac{1}{4}\cdot\tan^{-1}\dfrac{x^5}{4} + C$

# Calculus Practice 3.3B5: Techniques for Finding Antiderivatives 13a

**Evaluate each indefinite integral. Use the provided substitution.**

1) $\int \frac{6x}{3x^2\sqrt{9x^4-25}}\,dx;\ u=3x^2$

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

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

D) $\sec^{-1}|3x^2|+C$

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

*A) $\sec^{-1}|3x^3|+C$

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

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

D) $\frac{1}{2}\cdot\tan^{-1}\frac{3x^3}{2}+C$

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

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

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

*C) $\sec^{-1}|x^4|+C$

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

4) $\int \frac{20x^4}{1+16x^{10}}\,dx;\ u=4x^5$

A) $\frac{1}{2}\cdot\sec^{-1}\frac{|4x^5|}{2}+C$

*B) $\tan^{-1}4x^5+C$

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

D) $\frac{1}{4}\cdot\sec^{-1}\frac{|4x^5|}{4}+C$

5) $\int \frac{20x^4}{\sqrt{1-16x^{10}}}\,dx;\ u=4x^5$

A) $\frac{1}{3}\cdot\sec^{-1}\frac{|4x^5|}{3}+C$

*B) $\sin^{-1}4x^5+C$

C) $\sec^{-1}|4x^5|+C$

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

6) $\int \frac{15x^2}{5x^3\sqrt{25x^6-9}}\,dx;\ u=5x^3$

A) $\sec^{-1}|5x^3|+C$

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

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D) $\frac{1}{4}\cdot\sec^{-1}\frac{|3x^2|}{4}+C$

8) $\int \frac{8x}{25+16x^4}\,dx;\ u=4x^2$

A) $\frac{1}{4}\cdot\sec^{-1}\frac{|4x^2|}{4}+C$

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

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

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

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

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

B) $\frac{1}{3} \cdot \tan^{-1} \frac{2x^5}{3} + C$

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

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

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

A) $\frac{1}{2} \cdot \tan^{-1} \frac{x^4}{2} + C$

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

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

D) $\tan^{-1} x^4 + C$

11) $\int \frac{20x^3}{1 + 25x^8}\,dx;\ \ u = 5x^4$

A) $\frac{1}{5} \cdot \sec^{-1} \frac{\left|5x^4\right|}{5} + C$

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

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

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

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C) $\frac{1}{3} \cdot \tan^{-1} \frac{5x^4}{3} + C$

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

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

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

*C) $\frac{1}{4} \cdot \sec^{-1} \frac{\left|x^5\right|}{4} + C$

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