Calculus Practice: Techniques for Finding Antiderivatives 15a

Evaluate each indefinite integral. Use the provided substitution.

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

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

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

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

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

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

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

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

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

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

3) $\int \frac{3e^{3x}}{1+e^{6x}}\,dx;\ u = e^{3x}$

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

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

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

D) $\sin^{-1}\frac{e^{3x}}{3}+C$

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

7) $\int \frac{e^x}{9+e^{2x}}\,dx;\ u = e^x$

A) $\tan^{-1} e^x + C$

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

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

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

8) $\int \frac{3e^{3x}}{e^{3x}\sqrt{e^{6x}-16}}\,dx;\ u = e^{3x}$

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

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

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

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

9) $\int \frac{2e^{2x}}{1+e^{4x}}\,dx;\ u = e^{2x}$

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

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

C) $\tan^{-1} e^{2x} + C$

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

10) $\int \frac{e^x}{e^x\sqrt{e^{2x}-16}}\,dx;\ u = e^x$

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

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

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

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

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

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

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

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

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

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

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

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

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

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

13) $\int \frac{3e^{3x}}{25+e^{6x}}\,dx;\ u = e^{3x}$

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

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

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

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

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

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

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

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

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

Name________________________________

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