Calculus Practice: Techniques for Finding Antiderivatives 14b

Evaluate each indefinite integral. Use the provided substitution.

1) $\int \frac{1}{x\left(9+(\ln -4x)^2\right)}\,dx;\ u = \ln -4x$

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

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

4) $\int \frac{1}{x\left(16+(\ln -x)^2\right)}\,dx;\ u = \ln -x$

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

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

7) $\int \frac{1}{x\left(1+(\ln -5x)^2\right)}\,dx;\ u = \ln -5x$

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

9) $\int \frac{1}{x\left(25+(\ln -x)^2\right)}\,dx;\ u=\ln -x$

10) $\int \frac{1}{x\sqrt{1-(\ln\ x)^2}}\,dx;\ u=\ln\ x$

11) $\int \frac{1}{x\sqrt{25-(\ln -x)^2}}\,dx;\ u=\ln -x$

12) $\int \frac{1}{x\sqrt{16-(\ln\ 3x)^2}}\,dx;\ u=\ln\ 3x$

13) $\int \frac{1}{x\left(16+(\ln -2x)^2\right)}\,dx;\ u=\ln -2x$

14) $\int \frac{1}{x\sqrt{25-(\ln -5x)^2}}\,dx;\ u=\ln -5x$

15) $\int \frac{1}{x\sqrt{9-(\ln -5x)^2}}\,dx;\ u=\ln -5x$

16) $\int \frac{1}{x\cdot\ln\ 5x\cdot\sqrt{(\ln\ 5x)^2-25}}\,dx;\ u=\ln\ 5x$

Name________________________________

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Evaluate each indefinite integral. Use the provided substitution.

1) $\displaystyle\int \frac{1}{x\left(9 + (\ln -4x)^2\right)}\,dx;\ \ u = \ln -4x$

$\displaystyle\frac{1}{3} \cdot \tan^{-1} \frac{\ln -4x}{3} + C$

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

$\displaystyle\frac{1}{2} \cdot \sec^{-1} \frac{|\ln 2x|}{2} + C$

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

$\displaystyle\sin^{-1} \frac{\ln 2x}{5} + C$

4) $\displaystyle\int \frac{1}{x\left(16 + (\ln -x)^2\right)}\,dx;\ \ u = \ln -x$

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

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

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

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

$\displaystyle\frac{1}{3} \cdot \sec^{-1} \frac{|\ln -3x|}{3} + C$

7) $\displaystyle\int \frac{1}{x\left(1 + (\ln -5x)^2\right)}\,dx;\ \ u = \ln -5x$

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

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

$\sec^{-1} |\ln -3x| + C$

9) $\int \frac{1}{x\left(25 + (\ln -x)^2\right)}\,dx;\ u = \ln -x$

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

10) $\int \frac{1}{x\sqrt{1 - (\ln x)^2}}\,dx;\ u = \ln x$

$\sin^{-1} \ln x + C$

11) $\int \frac{1}{x\sqrt{25 - (\ln -x)^2}}\,dx;\ u = \ln -x$

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

12) $\int \frac{1}{x\sqrt{16 - (\ln 3x)^2}}\,dx;\ u = \ln 3x$

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

13) $\int \frac{1}{x\left(16 + (\ln -2x)^2\right)}\,dx;\ u = \ln -2x$

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

14) $\int \frac{1}{x\sqrt{25 - (\ln -5x)^2}}\,dx;\ u = \ln -5x$

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

15) $\int \frac{1}{x\sqrt{9 - (\ln -5x)^2}}\,dx;\ u = \ln -5x$

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

16) $\int \frac{1}{x \cdot \ln 5x \cdot \sqrt{(\ln 5x)^2 - 25}}\,dx;\ u = \ln 5x$

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