Name________________________________

Calculus Practice: Techniques for Finding Antiderivatives 19b

Evaluate each indefinite integral.

1) $\int \frac{(\ln x)^2}{x}\, dx$

2) $\int \sin^{-1} x\, dx$

3) $\int \ln (x+1)\, dx$

4) $\int \tan^{-1} x\, dx$

5) $\int x\sec^2 x\, dx$

6) $\int \ln\left(x^2 + 1\right) dx$

7) $\int x\tan^{-1} x\, dx$

8) $\int \frac{xe^x}{(x+1)^2}\, dx$

9) $\int \cos^{-1} x\, dx$

10) $\int x^3 e^{x^2}\, dx$

Calculus Practice: Techniques for Finding Antiderivatives 19b

Evaluate each indefinite integral.

1) $\int \frac{(\ln x)^2}{x}\, dx$

Use: $u = \ln x,\ dv = \frac{\ln x}{x}\, dx$

$\int \frac{(\ln x)^2}{x}\, dx = \frac{(\ln x)^3}{3} + C$

2) $\int \sin^{-1} x\, dx$

Use: $u = \sin^{-1} x,\ dv = dx$

$\int \sin^{-1} x\, dx = x\sin^{-1} x + (1 - x^2)^{\frac{1}{2}} + C$

3) $\int \ln (x + 1)\, dx$

Use: $u = \ln (x + 1),\ dv = dx$ *or use u-subs first

$\int \ln (x + 1)\, dx = x\ln (x + 1) - x + \ln (x + 1) + C$

4) $\int \tan^{-1} x\, dx$

Use: $u = \tan^{-1} x,\ dv = dx$

$\int \tan^{-1} x\, dx = x\tan^{-1} x - \frac{\ln (x^2 + 1)}{2} + C$

5) $\int x\sec^2 x\, dx$

Use: $u = x,\ dv = \sec^2 x\, dx$

$\int x\sec^2 x\, dx = x\tan x + \ln \cos x + C$

6) $\int \ln \left(x^2 + 1\right) dx$

Use: $u = \ln \left(x^2 + 1\right),\ dv = dx$

$\int \ln \left(x^2 + 1\right) dx = x\ln \left(x^2 + 1\right) - 2x + 2\tan^{-1} x + C$

7) $\int x\tan^{-1} x\, dx$

Use: $u = \tan^{-1} x,\ dv = x\, dx$

$\int x\tan^{-1} x\, dx = \frac{x^2\tan^{-1} x - x + \tan^{-1} x}{2} + C$

8) $\int \frac{xe^x}{(x + 1)^2}\, dx$

Use: $u = xe^x,\ dv = \frac{1}{(x + 1)^2}\, dx$

$\int \frac{xe^x}{(x + 1)^2}\, dx = \frac{e^x}{x + 1} + C$

9) $\int \cos^{-1} x\, dx$

Use: $u = \cos^{-1} x,\ dv = dx$

$\int \cos^{-1} x\, dx = x\cos^{-1} x - \left(1 - x^2\right)^{\frac{1}{2}} + C$

10) $\int x^3 e^{x^2}\, dx$

Use: $u = x^2,\ dv = xe^{x^2}\, dx$

$\int x^3 e^{x^2}\, dx = \frac{\left(x^2 - 1\right) \cdot e^{x^2}}{2} + C$