

AB Calculus
No Calculator

INTEGRATION REVIEW #3
Integration by Parts

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| 1. $\int x \ln x \, dx = \frac{x^2}{2} \ln x - \frac{x^2}{4} + C$ | 11. $\int \cos x \ln(\sin x) \, dx$ $\sin x \ln \sin x - \sin x + C$ |
| 2. $\int x \sec^2 x \, dx$ $x \tan x + \ln \cos x + C$ | 12. $\int \frac{\ln x}{x^2} \, dx = -\frac{\ln x}{x} - \frac{1}{x} + C$ |
| 3. $\int x \cos 5x \, dx$ $\frac{x}{5} \sin 5x + \frac{1}{25} \cos 5x + C$ | 13. $\int (x\sqrt{x+3}) \, dx = \frac{2}{3} x(x+3)^{3/2} - \frac{4}{15} (x+3)^{5/2} + C$ |
| 4. $\int (\ln x)^2 \, dx$ $x(\ln x)^2 - 2x \ln x + 2x + C$ | ⑭ $\int \sin^2 x \, dx = \int (1 - \cos 2x) \frac{1}{2} \, dx = \frac{1}{2} x - \frac{1}{4} \sin 2x + C$ Use half angle formula |
| 5. $\int x e^{-x} \, dx$ $-x e^{-x} - e^{-x} + C$ | 15. $\int \frac{x}{e^x} \, dx = \int x e^{-x}$ |
| 6. $\int \sin^{-1} x \, dx$ $x \sin^{-1} x + (1-x^2)^{1/2} + C$ | 16. $\int e^x \sin x \, dx = \frac{1}{2} [e^x \sin x - e^x \cos x] + C$ |
| 7. $\int x \sin(3x) \, dx$ $-\frac{1}{3} x \cos(3x) + \frac{1}{9} \sin(3x) + C$ | 17. $\int x^2 \sin x \, dx = -x^2 \cos x + 2x \sin x + 2 \cos x + C$ |
| 8. $\int \ln(2x+1) \, dx$ $x \ln 2x+1 - x + \frac{1}{2} \ln 2x+1 + C$ | 18. $\int \ln x \, dx = x \ln x - x + C$ |
| 9. $\int \cos(\ln x) \, dx$ $\frac{1}{2} [x \cos(\ln x) + x \sin(\ln x)] + C$ | 19. $\int x e^{5x} \, dx = \frac{x}{5} e^{5x} - \frac{1}{25} e^{5x} + C$ |
| 10. $\int x^3 e^x \, dx$ $x^3 e^x - 3x^2 e^x + 6x e^x - 6e^x + C$ | 20. $\int x^2 e^{5x} \, dx = \frac{x^2}{5} e^{5x} - \frac{2x}{25} e^{5x} + \frac{2}{125} e^{5x} + C$ |