

1. Evaluate $\int 2x \cos(x) dx$.
2. Evaluate $\int x^2 \ln x dx$.
3. Evaluate $\int_0^{\pi^2} \cos(\sqrt{x}) dx$.
4. Evaluate $\int \arctan(4t) dt$.
5. Evaluate $\int y^2 \sin(y) dy$.
6. Evaluate $\int_{-1}^4 x^2 e^{-x} dx$.
7. Evaluate $\int x^2 \arcsin(x) dx$.
8. Evaluate $\int \cos(2x) \sin(5x) dx$.
9. Evaluate $\int_{\pi}^{5\pi/2} \cos(2x) e^{3x} dx$.
10. Evaluate $\int (\sin(x))^2 dx$.
11. If f and g are twice differentiable, $f(0) = g(0) = 0$, and f'' and g'' are continuous, what can you say about $\int_0^a f(x)g''(x) dx$?
12. Evaluate $\int (\ln(x))^2 dx$.
13. Prove that $\int (\ln(x))^n dx = x(\ln(x))^n - n \int (\ln(x))^{n-1} dx$.