

Evaluate each integral. Check by differentiating.

1. $\int x \ln x \, dx$

2. (*) $\int (\ln x)^2 \, dx$

3. (*) $\int (x - 3) \sin(5x + 1) \, dx$

4. (**) $\int (x^2 + 5)e^{2x} \, dx$

5. (**) $\int x^3 \cos(4x^2 - 2) \, dx$

6. (**) $\int e^{\sqrt{x}} \, dx$

Hint: make a substitution first.