Math 141H Homework 7 (Section 8.1)  Due 3/12

Show all your work. Jumping to the right answer without minimum reasoning deserves no credit.

1. Compute the integral

(1) \( \int_0^{\frac{\pi}{2}} x \cdot \sin x \, dx \)

(2) \( \int_1^e x^2 \ln x \, dx \)

(3) \( \int_0^1 x \cdot 2^x \, dx \)

(4) \( \int_1^e (\ln x)^2 \, dx \)

(5) \( \int x \cdot \sec^2 x \, dx \)

(6) \( \int \cos \sqrt{x} \, dx \)

2. Find the indefinite integral \( \int \sin(\ln x) \, dx \) by the following two steps.

(1) Let \( u = \sin(\ln x) \) and rewrite the above integral in the integral of \( u \).

(2) Let \( v = \sin^{-1} u \) and integrate by parts twice.