Math 231 Worksheet 9

1. Simplify the expression.

$$(a) \ \ln(2\sqrt{e}) - \ln 2 \qquad\qquad (b) \ \ln \frac{x^2}{x^2 - 1}$$

2. Differentiate the function.

$$(a) \ x(\ln x) - x \qquad\qquad (b) \ e^{-x^2}$$

3. Evaluate the integral.

$$(a) \ \int_1^e \frac{\ln x}{x} \, dx \qquad\qquad (b) \ \int \frac{e^{-\frac{1}{x}}}{x^2} \, dx$$

Answers.

1. (a) $\frac{1}{2}$ (b) $2\ln x - \ln(x-1) - \ln(x+1)$

2. (a) $\ln x$ (b) $-2xe^{-x^2}$

3. (a) $\frac{1}{2}$ (let $u = \ln x$)   (b) $e^{-\frac{1}{x}} + C$ (let $u = -\frac{1}{x}$)