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1. Calculate f_{xx}, f_{yy}, f_{xy}, when $f(x,y) = \ln \dfrac{1}{\sqrt{x^2+y^2}}$. Here $f_x = \partial f/\partial x$ etc.

2. Calculate the implicit derivative dy/dx from the equations
    a) $f(x,y) = y - \ln y - x^2 + 1 = 0$
    b) $f(x,y) = x^2 - y^2 = 1$ (special case of hyperbola)

3. Determine the integrals

$$\text{a) } \int_0^2 \sin\frac{\pi x}{2}\, dx, \quad \text{b) } \int_{-\pi}^{\pi} \cos\frac{x}{6}\, dx, \quad \text{c) } \int \sin x \cos x\, dx$$

4. Calculate the definite integrals

$$\text{a) } \int_1^2 \frac{dx}{x^2+2x}, \quad \text{b) } \int_{3/2}^2 \frac{dx}{1-x^2}$$

5. Determine the integral functions

$$\text{a) } \int x \sin x\, dx, \quad \text{b) } \int x^2 \ln x\, dx, \quad \text{c) } \int xe^x\, dx \ \text{ja d) } \int \frac{\ln x}{x^2}\, dx.$$