1.   Find the exact length of the curve

$y = \frac{1}{4}x^2 - \frac{1}{2}\ln x, \quad 1 \leqslant x \leqslant 2$

2.   Determine whether the following integral is convergent or divergent and evaluate in case of convergent.

$$\int_e^\infty \frac{1}{x(\ln x)^3}\,dx$$

1. Find the exact length of the curve

$$x = \frac{y^4}{8} + \frac{1}{4y^2}, \quad 1 \leqslant y \leqslant 2$$

2. Determine whether the following integral is convergent or divergent and evaluate in case of convergent.

$$\int_0^9 \frac{1}{\sqrt[3]{x-1}} dx$$

1.   Find the exact length of the curve

$$x = \frac{y^4}{8} + \frac{1}{4y^2}, \quad 1 \leqslant y \leqslant 2$$

2.   Determine whether the following integral is convergent or divergent and evaluate in case of convergent.
$$\int_0^1 \frac{\ln x}{\sqrt{x}} dx$$