

Provide a clear and organized presentation. Evaluate the following two integrals.

1.
$$\int_0^8 \int_{\sqrt[3]{x}}^2 \sin y^4 dy dx$$

2.
$$\int_2^3 \int_0^1 \frac{y^4 + 1}{(y^3 - y - 6)\sqrt{x^2 - 1} \ln^3 \sqrt[4]{x + \sqrt{x^2 - 1}}} dy dx$$