Q.No.1:- Suppose that $x$ and $y$ are differentiable functions of $t$ and are related by the equation $x^2 y^3 = 4/27$. If $\frac{dy}{dt} = \frac{1}{2}$, then find the value of $\frac{dx}{dt}$ at $x = 2$.

Final Answer (2 point): ________

Work Shown (5 points):
Q.No.2: If \( y = \log_5 \left( \frac{x+4}{x-4} \right)^{\ln 5} \), then find \( \frac{dy}{dx} \).

Final Answer (1 point): _________

Work Shown (4 points):
Q.No.3: A body is moving along a straight line with position function \( s(t) = -t^3 + 3t^2 - 1, t > 0 \). Find the total distance traveled by the body from \( t = 1 \) to \( t = 3 \). (s in meters, t in seconds)

Final Answer (2 point): __________

Work Shown (4 points):
Q.No.4:- If \( f(x) = x^3 - 3x^2 - 1 \), \( x \geq 2 \), then find the value of \( \frac{df^{-1}}{dx} \) at \( x = -1 \).

Final Answer (2 points): _________

Work Shown (5 points):