

1. Evaluate the integral  $\int_{-1}^1 x \sin(x^2) dx$ .

2. Evaluate the integral  $\int_{\frac{1}{3}}^1 \frac{2}{x^2} \left(3 - \frac{1}{x}\right)^3 dx$ .

3. Find the inverse of  $f(x) = \frac{1}{x-1}$ . What are the domain and range of  $f^{-1}$ ?