(1) Let \( f(x) = e^{x^2} \). Approximate the area underneath \( f \) on interval \([1, 3]\) using the lefthand endpoint rule. Use \( n = 4 \).

(2) Write the following limit as an integral. Do \textbf{NOT} evaluate it.

\[
\lim_{n \to \infty} \sum_{i=1}^{n} \cos \left( 2 + \frac{3i}{n} \right) \frac{1}{n}.
\]
(3) Write the following integral as a Riemann sum with proper notation. Do NOT evaluate the limit.

\[ \int_{-3}^{5} xe^{x^2} \, dx. \]

(4) Use the fundamental theorem of calculus to find the derivative of \( g(x) \) where

\[ g(x) = \int_{0}^{x} t \cos(t^2) \, dt. \]

(5) Use the fundamental theorem of calculus to find the derivative of \( g(x) \) where

\[ g(x) = \int_{x^2}^{x^3} \ln(t) \, dt. \]
(6) Evaluate \( \int_{-2}^{3} f(x) \, dx \) where \( f \) is the graph shown.

(7) Evaluate \( \int_{-2}^{3} (3x^2 - e^x) \, dx \)

(8) Evaluate \( \int x(x^2 + 4)^{-9} \, dx \)
(9) Evaluate \( \int (x + \frac{3}{x})^2 \, dx \).

(10) Find the \textbf{exact} area underneath \( f(x) = x^2 \) on interval \([1, 2]\) using the Riemann sum method. Show all steps. No credit if you do this problem by any other method. Recall that \( \sum_{i=1}^{n} i^2 = \frac{n(n+1)(2n+1)}{6} \) and \( \sum_{i=1}^{n} i = \frac{n(n+1)}{2} \).