5. [10 points] The graph of the function \( f(x) \) is shown below. Note that \( f(x) \) is linear on the interval \((-3, 1)\).

![Graph of f(x)](image)

a. [6 points] The function \( g(x) \) is given by the equation

\[
g(x) = \begin{cases} 
  e^{px} & x \leq 0 \\
  C f(x) & x > 0 
\end{cases}
\]

where \( C \) and \( p \) are constants and \( f \) is as above. Find one pair of exact values for \( C \) and \( p \) such that \( g(x) \) is differentiable, or write none if there are none. Be sure your work is clear.

Part of the graph of the function \( h(x) \) is shown below.

![Graph of h(x)](image)

Note that \( h(4) = -\frac{\sqrt{2}}{3} \).

b. [2 points] Complete the following sentence.

Because the function \( h(x) \) satisfies the hypotheses of the mean value theorem on the interval \([2, 4]\), there must be some point \( c \) with \( 2 \leq c \leq 4 \) such that . . .

c. [2 points] On which of the following intervals does \( h(x) \) satisfy the hypotheses of the mean value theorem? List all correct answers, or write none.

\([-1, 0] \quad [0, 3] \quad [1, 4]\)