1. [17 points] Let \( g(x) \) and \( h(x) \) be two functions. The graphs of \( g'(x) \) and \( h''(x) \) are shown below.

At right is the graph of \( y = g'(x) \), the derivative of \( g(x) \).
Assume that \( g(x) \) is a continuous function.
Use the graph to answer the questions below. Circle all correct answers.

a. [2 points] At which of the following values of \( x \) is \( g(x) \) not differentiable?
   \( x = 2 \) \( x = 4 \) \( x = 5 \) \( x = 6 \) \( x = 7 \) NONE OF THESE

b. [2 points] For which of the following values of \( x \) does \( g(x) \) have a local maximum?
   \( x = 2 \) \( x = 4 \) \( x = 5 \) \( x = 6 \) \( x = 7.5 \) NONE OF THESE

c. [2 points] For which of the following values of \( x \) does \( g(x) \) have an inflection point?
   \( x = 2 \) \( x = 3 \) \( x = 4 \) \( x = 5 \) \( x = 7.5 \) NONE OF THESE

d. [2 points] On which of the following intervals is \( g(x) \) linear?
   \( (0, 2) \) \( (4, 6) \) \( (6, 7) \) \( (6, 8) \) \( (7, 8) \) NONE OF THESE

e. [2 points] For which of the following values of \( x \) does \( g(x) \) attain a global maximum on the interval \([1, 7]\)?
   \( x = 2 \) \( x = 4 \) \( x = 5 \) \( x = 6 \) \( x = 7 \) NONE OF THESE

Use the graph of \( y = h''(x) \), the second derivative of \( h(x) \), to answer the questions below. Circle all correct answers.

f. [2 points] Over which of the following intervals is \( h(x) \) concave up on the entire interval?
   \( (0, 1) \) \( (1, 3) \) \( (2, 4) \) \( (4, 5) \) NONE OF THESE

g. [2 points] On which of the following intervals is the function \( h'(x) \) (the derivative of \( h(x) \)) decreasing over the entire interval?
   \( (0, 1) \) \( (1, 3) \) \( (2, 3) \) \( (4, 5) \) NONE OF THESE

h. [3 points] If \( h'(4) = 0 \), which of the following statements must be true?
   A. \( x = 4 \) is a local maximum of \( h(x) \).
   B. \( x = 4 \) is a local minimum of \( h(x) \).
   C. \( x = 4 \) is an inflection point of \( h'(x) \).
   D. \( x = 4 \) is a critical point of \( h(x) \).
   E. \( x = 4 \) is an inflection point of \( h(x) \).
   F. NONE OF THESE