6. [4 points] The graph of the function \( f(x) \) is shown below. Note that \( f(x) \) has a vertical tangent line at \( x = 5 \).

\[ y = f(x) \]

\[ -5 \quad -3 \quad -1 \quad 1 \quad 2 \quad 3 \quad 4 \quad 5 \quad 6 \quad 7 \quad 8 \quad 9 \quad 10 \quad 11 \quad 12 \]

\[ x \]

a. [2 points] On which of the following intervals does the function \( f(x) \) satisfy the hypotheses of the Mean Value Theorem? Circle the correct answer(s).

[0,2] [1,3] [2,4] [3,5] NONE OF THESE

b. [2 points] On the interval [8, 12] the hypotheses of the Mean Value Theorem are true for the function \( f(x) \). What does the conclusion of this theorem say in this interval?

Answer:

7. [5 points]

Yi is constructing a cardboard box. The base of the box will be a square of width \( w \) inches. The height of the box will be \( h \) inches. Yi will use gray cardboard for the sides of the box and brown cardboard for the bottom (the box does not have a top). Gray cardboard costs $0.05 per square inch, while brown cardboard costs $0.03 per square inch. Yi wants to spend $20 on the cardboard for his box.

Write a formula for \( h \) in terms of \( w \).

Answer: \( h = \)