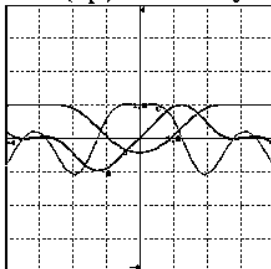




Homework 7.2 – Graph Analysis Using First and Second Derivatives

1. (1 pt) [alfredLibrary/AUCI/chapter7/lesson2/question1.pg](#)



Identify the graphs A (blue), B (red) and C (green) as the graphs of a function and its derivatives:

- ___ is the graph of the function
- ___ is the graph of the function's first derivative
- ___ is the graph of the function's second derivative

2. (1 pt) [alfredLibrary/AUCI/chapter7/lesson2/graphanalysis5pet.pg](#)

Let

$$f(x) = (9 - 6x)e^x.$$

Instructions:

If you are asked to find x - or y -values, enter either a number, a list of numbers separated by commas, or *None* if there aren't any solutions. Use **interval notation** if you are asked to find an interval or union of intervals, and enter $\{ \}$ if the interval is empty.

(a) Compute f' and perform sign tests to complete the following:

Critical numbers $x =$ _____

Increasing on _____

Decreasing on _____

Local maxima $x =$ _____

Local minima $x =$ _____

(b) Compute f'' and perform sign tests to complete the following:

Concave up on _____

Concave down on _____

Inflection points $x =$ _____

(c) Find any horizontal and vertical asymptotes of f .

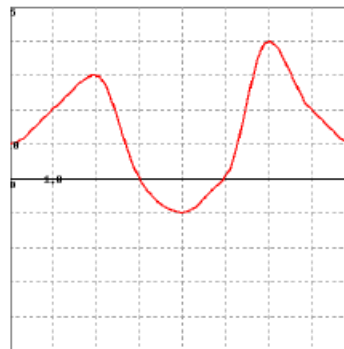
Horizontal asymptotes $y =$ _____

Vertical asymptotes $x =$ _____

(d) Sketch a graph of the function f without a graphing calculator. Find and plot the y -intercept and the x -intercepts, if any. Draw dashed lines for horizontal and vertical asymptotes. Plot the points where f has local maxima, local minima, and inflection points. Use what you know from parts (a) and (b) to sketch the remaining parts of the graph of f .

3. (1 pt) [alfredLibrary/AUCI/chapter7/lesson2/question33.pg](#)

Suppose $f(x)$ is a function. Below is the graph of the **DERIVATIVE** f' on the interval $(0,8)$. This **IS NOT** the graph of f .



Refer to the graph to answer each of the following questions. For part (a), use **interval notation** to report your answer.

(a) For which values of x in $(0,8)$ is f increasing? (If the function is not increasing anywhere, then enter (empty braces).)

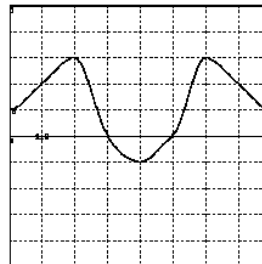
Increasing on _____

(b) Find all values of x in $(0,8)$ at which f has a local minimum, and list them (separated by commas) in the box below. (If there are no local minima, then enter *none*.)

Local minima at $x =$ _____

4. (1 pt) [alfredLibrary/AUCI/chapter7/lesson2/question44.pg](#)

Suppose $f(x)$ is a function. Below is the graph of the **DERIVATIVE** f' on the interval $(0,8)$. This **IS NOT** the graph of f .



Refer to the graph to answer each of the following questions. For part (a), use **interval notation** to report your answer.

(a) For which values of x in $(0,8)$ is f concave down? (If the function is not concave down anywhere, then enter *none*.)

Concave down on _____

(b) Find all values of x in $(0,8)$ where f has an inflection point, and list them (separated by commas) in the box below. (If there are no inflection points, then enter *none*.)

Inflection Points at $x =$ _____