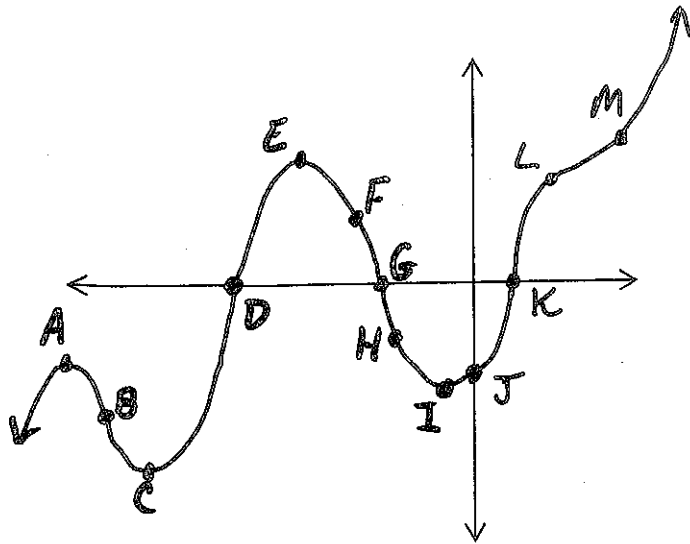


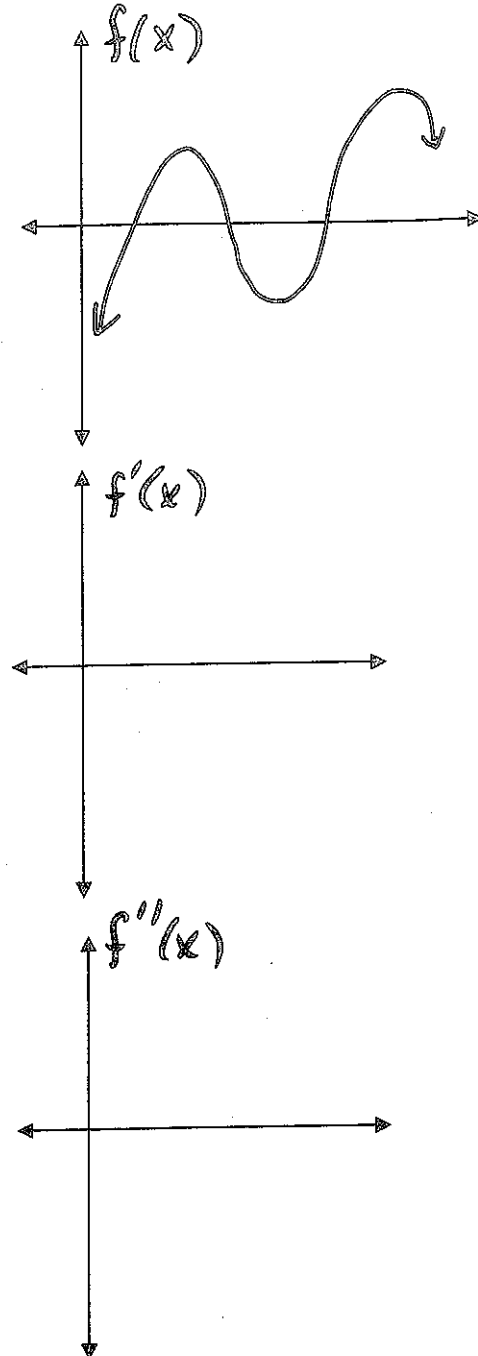
# Function Analysis Using Derivatives and Curve Sketching

Part A: If possible, list all points on the function below which appear to meet the stated conditions. Note: There is a vertical tangent at k.

- 1)  $f'(x) > 0$  but finite
- 2)  $f'(x) > 0$  and  $f''(x) > 0$
- 3)  $f'(x) = 0$  and  $f''(x) > 0$
- 4)  $f'(x) = 0$  and  $f''(x) < 0$
- 5)  $f''(x) = 0$
- 6)  $f(x) = 0$  and  $f'(x) > 0$
- 7)  $f'(x) = 0$  and  $f''(x) = 0$
- 8)  $f(x) = 0$  and  $f'(x) > 0$  and  $f''(x) > 0$
- 9)  $f'(x) < 0$  and  $f''(x) < 0$

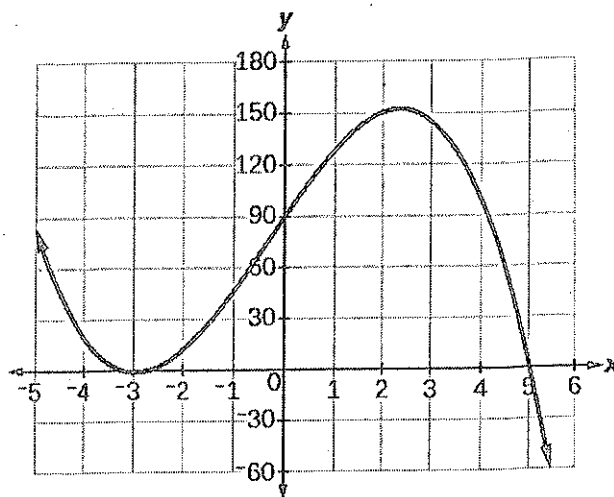


Part 2: Given the sketch of a function below, sketch the first and second derivatives on the axes provided.



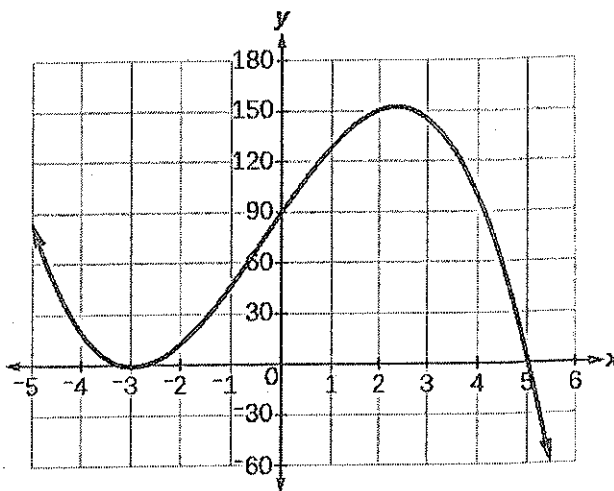
A. Consider the graph of  $f$ . Where does  $f$  have:

1. critical points:
2. interval of increase:
3. interval of decrease:
4. extrema:
5. inflection point:
6. interval of concave up:
7. interval of concave down:



B. Consider the graph of  $f'$ , the derivative of  $f$ . Where does  $f$  have:

1. critical points:
2. interval of increase:
3. interval of decrease:
4. extrema:
5. inflection points:
6. interval of concave up:
7. interval of concave down:



C. Consider the graph of  $f''$ , the derivative of  $f'$  and the second derivative of  $f$ . Where does  $f$  have:

1. inflection points:
2. interval of concave up:
3. interval of concave down:

