AP Calculus

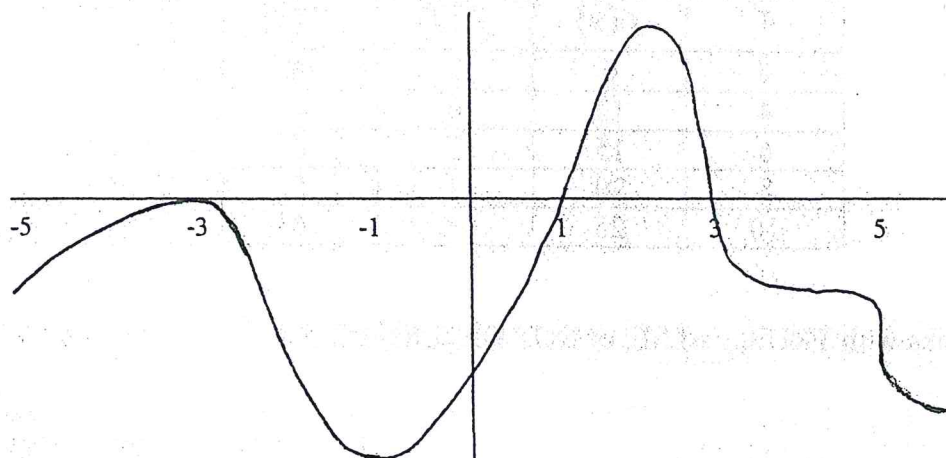## Graphical and Numeric Evaluations of f, f' and f''

1. The graph below is the graph of f', the derivative of f.

   The domain of the derivative is $-5 \leq x \leq 6$.

a)   The critical points (numbers) for f are $x =$ _____.

b)   The critical points (numbers) for f' are $x =$ _____.

c) f has a local maximum when $x =$ _____.

d) f has its maximum value on $[-5, 6]$ when $x =$ _____.

e) f is decreasing on the interval(s) _____.

f)   The graph of f is concave up on the interval(s) _____.

g)   The x – coordinate of the points of inflection are $x =$ _____.

h) f' has its maximum value when $x =$ _____.

i) f'' has its maximum value when $x =$ _____.

j)   Does f' have a minimum value on $[-5, 6]$? Explain.

   _____.

k)   Does f'' have a minimum value on $[-5, 6]$? Explain.

   _____.

2. Given that f, f' and f'' are all continuous for all x, use the information in the table to answer the questions that follow.

x	$f(x)$	$f'(x)$	$f''(x)$
2	6	2	−8
4	12	0	−1
6	15	3	0
8	20	4	5
10	25	2	6

Fill in the blanks with TRUE, FALSE, or NOT DETERMINED

a) f has a local minimum at $x=8$.   _____

b) f has a local maximum at $x=4$.   _____

c) f has a POI when $x=6$.   _____

d) f has a POI on the interval $6<x<10$.   _____

e) f is increasing on $[2,10]$.   _____

f) $f(x)=17$ has a solution in $[2,10]$.   _____

g) $f'(x)=2.25$ has a solution in $[6,8]$.   _____

h) $f'(x)=2.50$ has a solution in $[6,8]$.   _____

i) $f'(x)=2.75$ has a solution in $[6,8]$.   _____

j)   The line $y=15$ is a horizontal asymptote.   _____

k)   The line $x=7$ is a vertical asymptote.   _____