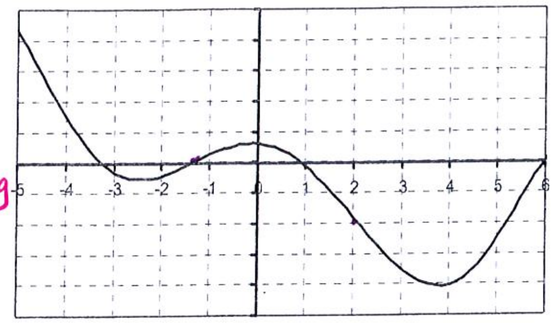
READING GRAPHS

$f'(x)$



1. A graph of $f'(x)$ is given at the right.

A. On what interval(s) is $f(x)$ increasing? Decreasing? Explain.

(-5, -3.2)
(-1.5, 1) } f is increasing when f' > 0

(-3.2, -1.5)
(1, 6) } f is decreasing when f' < 0

B. On what interval(s) is $f'(x)$ increasing? Decreasing? Explain.

(-2.5, 0)
(4, 6) } f' is increasing when f' has positive slope

(-5, -2.5)
(0, 4) } f' is decr. when f' has negative slope

* note why answers are the same

C. On what interval(s) is $f(x)$ concave up? Concave down? Explain.

~~(-5, -1.5)~~
~~(2, 6)~~

(-2.5, 0)
(4, 6) } f is concave up when f' is increasing

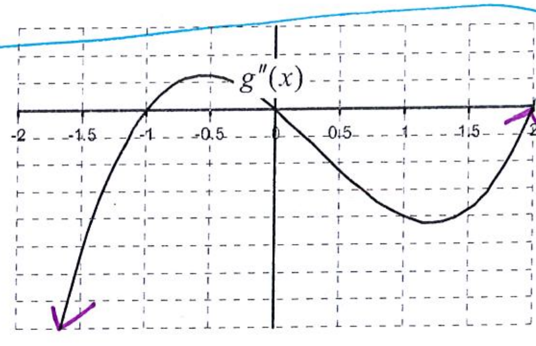
(-5, -2.5)
(0, 4) } f is concave down when f' is decreasing

D. On what interval(s) is $f'(x)$ concave up? Concave down? Explain.

(-5, -1.5)
(2, 6) } f' is concave up when it looks like a cup

(-1.5, 2) f' is concave down when it looks like a frown

2. A graph of $g''(x)$ is given at the right.



A. On what interval(s) is $g(x)$ concave up? Concave down? Explain.

(-1, 0) } g is concave up when g'' > 0

(-∞, -1)
(0, ∞) } g is concave down when g'' < 0

B. On what interval(s) is $g'(x)$ increasing? Decreasing? Explain.

(-1, 0) } g'' is increasing when g'' > 0

(-∞, -1)
(0, ∞) } g'' is decreasing when g'' < 0

* note why answers are the same

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 D, J, L, M

2) $f'(x) > 0$ and $f''(x) > 0$ J, M

3) $f'(x) = 0$ and $f''(x) > 0$ I, C

4) $f'(x) = 0$ and $f''(x) < 0$ A, E

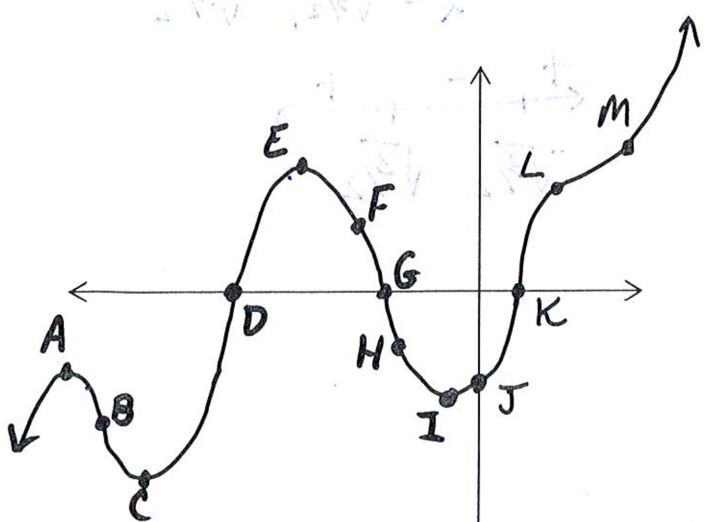
5) $f''(x) = 0$ B, D, G, K, L

6) $f(x) = 0$ and $f'(x) > 0$ D, K

7) $f'(x) = 0$ and $f''(x) = 0$ none

8) $f(x) = 0$ and $f'(x) > 0$ and $f''(x) > 0$ none

9) $f'(x) < 0$ and $f''(x) < 0$ F



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