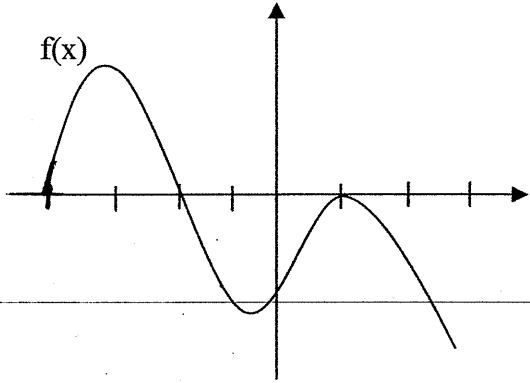


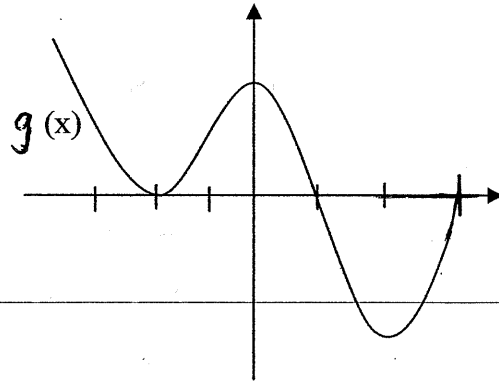
3.6b Interpreting Derivative Graphs

Make a sign line for slope and concavity for each of the following graphs

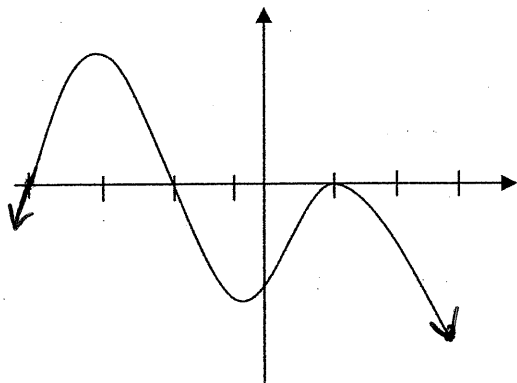
1)



2)



3. $f'(x)$ graph shown



Sketch $f(x)$ graph :

Sketch $f''(x)$ graph:

Characteristics of $f(x)$

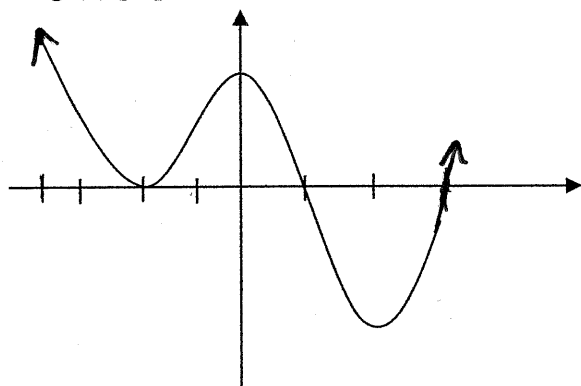
increasing: _____ decreasing _____

rel. max _____ rel. min _____

Concave up _____ Concave Down _____

POI _____

4. $g'(x)$ graph shown:



Sketch $f(x)$ graph :

Sketch $f''(x)$ graph:

Characteristics of $g(x)$

increasing: _____ decreasing _____

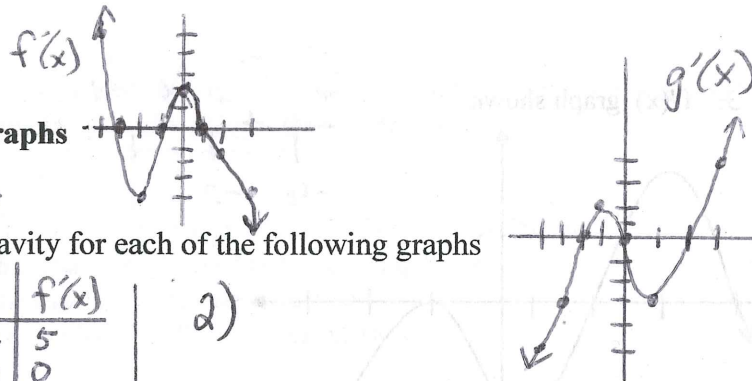
rel. max _____ rel. min _____

Concave up _____ Concave Down _____

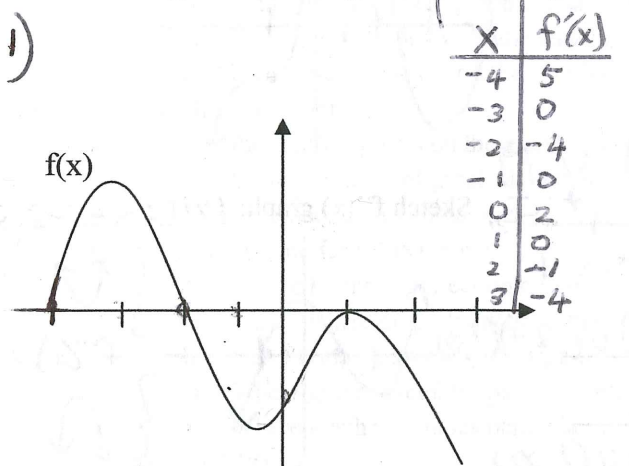
POI _____

3.6b Interpreting Derivative Graphs

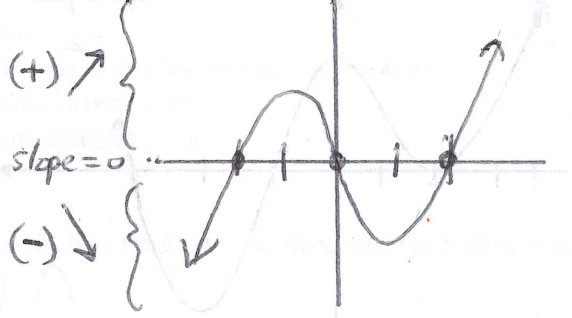
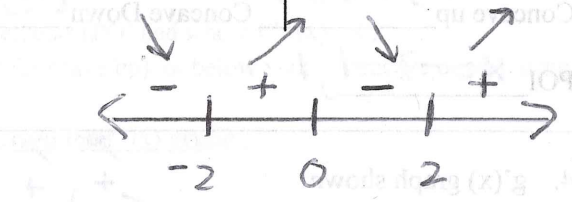
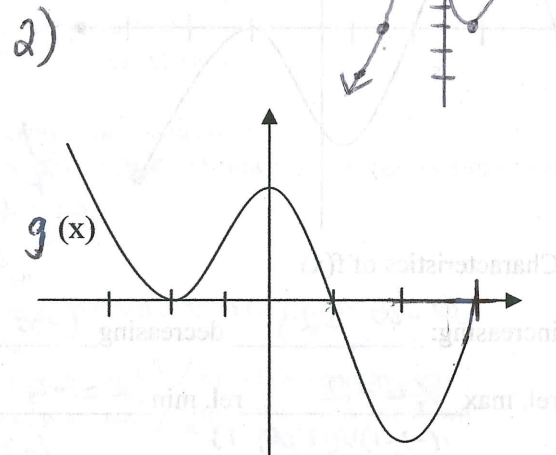
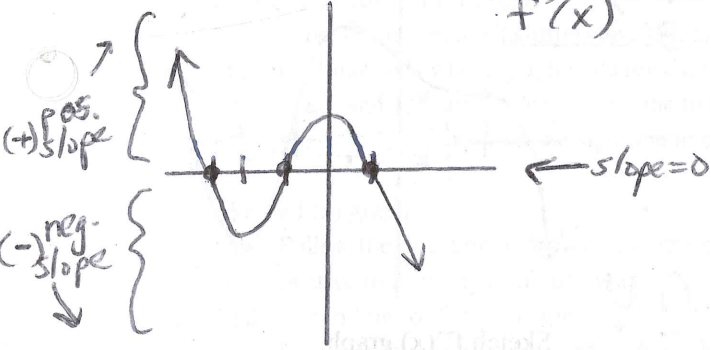
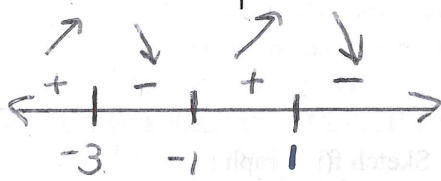
Make a sign line for slope and concavity for each of the following graphs



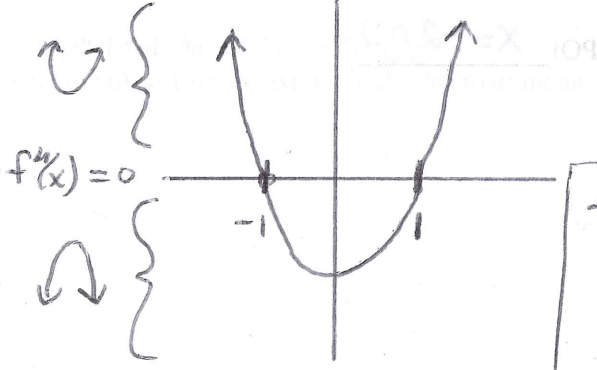
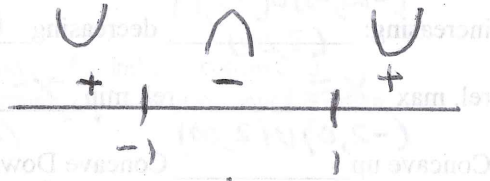
x	f'(x)
-4	-5
-3	-3
-2	0
-1	2
0	0
1	-3
2	0
3	4



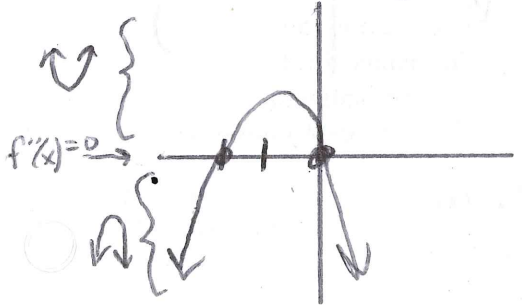
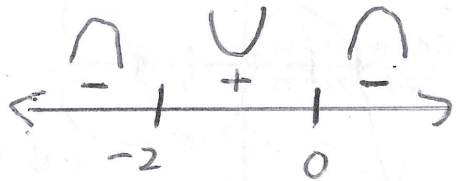
x	f'(x)
-4	5
-3	0
-2	-4
-1	0
0	2
1	0
2	-1
3	-4



POI: $x = -1, x = 1$

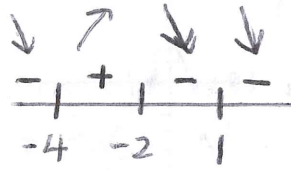
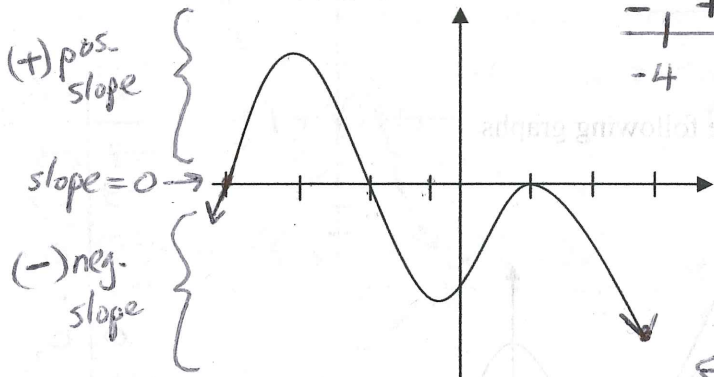


*POI at $x = -2, x = 0$

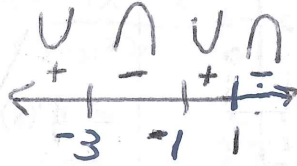
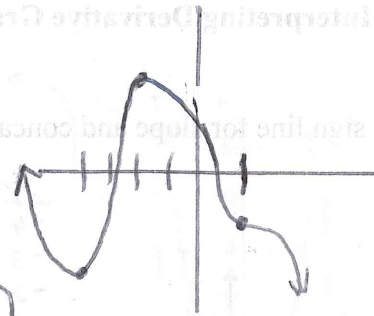


f(x)	f'(x)	f''(x)
X	X	X
M	M	M
P	P	P

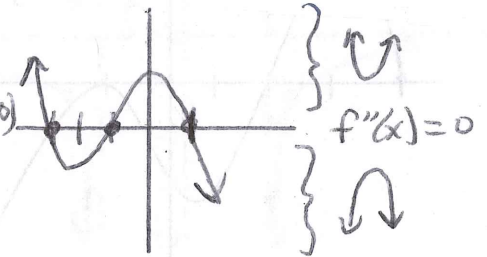
3. $f'(x)$ graph shown



Sketch $f(x)$ graph :



Sketch $f''(x)$ graph:



f
x
M
P
P
P

f'
x
M
M
P

f''
x
M
M
P

Characteristics of $f(x)$

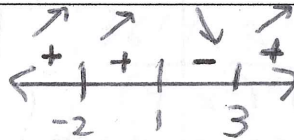
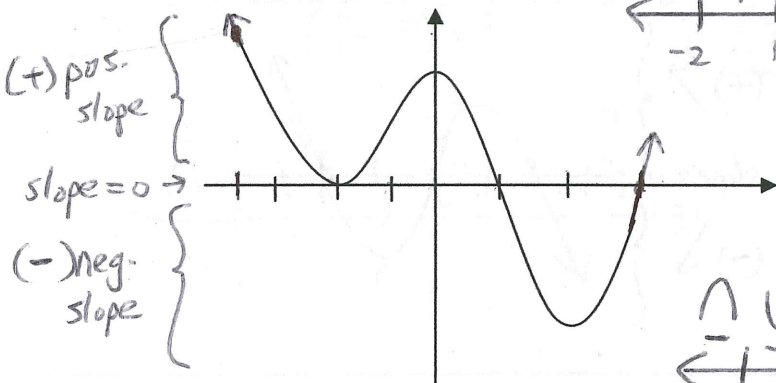
increasing: $(-4, -2)$ decreasing $(-\infty, -4) \cup (-2, 1) \cup (1, \infty)$

rel. max $x = -2$ rel. min $x = -4$

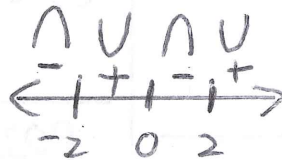
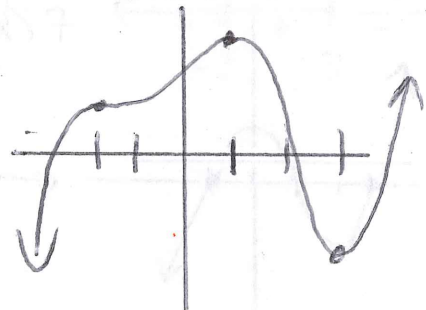
Concave up $(-\infty, -3) \cup (-1, 1)$ Concave Down $(-3, -1) \cup (1, \infty)$

POI $x = -3, -1, 1$

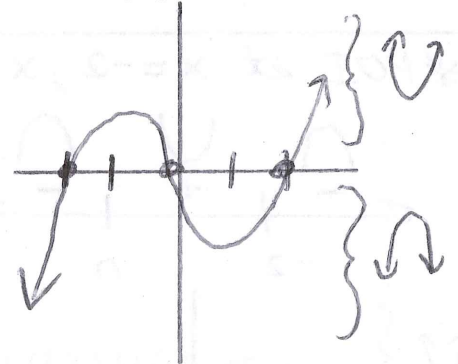
4. $g'(x)$ graph shown:



Sketch $f(x)$ graph :



Sketch $f''(x)$ graph:



Characteristics of $g(x)$

increasing: $(-\infty, -2) \cup (-2, 1)$ decreasing $(1, 3)$

rel. max $x = 1$ rel. min $x = 3$

Concave up $(-2, 0) \cup (2, \infty)$ Concave Down $(-\infty, -2) \cup (0, 2)$

POI $x = -2, 0, 2$

1. Sketching 1st Derivative and 2nd Derivative Graphs (Given the f(x) graph)

1. Given the f(x) graph
2. Make a sign line for f'(x) graph
 - a. Label Critical points (relative max, relative min, or where slope = 0) on sign line
 - b. Find intervals where graph is increasing (rising) and decreasing (falling)
 - c. Use + and ↗ arrow on the sign line to indicate increasing slope
 - d. Use - and ↘ arrow on the sign line to indicate decreasing slope
3. Sketch f'(x) graph
 - a. Plot critical points on the graph as x - intercepts (where slope = 0)
 - b. Sketch portions of graph above the x-axis (positive slope) or below x-axis (negative slope) using the information on your sign line.
4. Make a sign line for f''(x) graph
 - a. Locate Points of Inflection on your f(x) graph.
 - i. This is where graph transitions from concave up to down or from concave down to up.
 - b. Label critical point on your sign line
 - i. Where graph resembles parabola opening up, use + and ∪ to indicate concave up
 - ii. Where graph resembles parabola opening down, use - and ∩ to indicate concave down
5. Sketch f''(x) graph
 - a. Plot critical points on the graph as x - intercepts (POI and where f''(x) = 0)
 - b. Sketch portions of graph above the x-axis (concave up) or below x-axis (concave down) using the information on your sign line.

2. Sketching f(x) graph and 2nd Derivative Graph (Given the f'(x) graph)

1. Given the f'(x) graph
2. Make a sign line for f'(x) graph
 - a. Label Critical points (x-intercepts) on sign line
 - b. Find intervals where graph is increasing(above x-axis) and decreasing(below x-axis)
 - c. Use + and ↗ arrow on the sign line to indicate increasing slope
 - d. Use - and ↘ arrow on the sign line to indicate decreasing slope
3. Sketch f(x) graph
 - a. Follow the directional arrows on your sign line to draw the f(x) graph, along with the relative max (hills) and relative min (valleys) of your graph
4. Make a sign line for f''(x) graph
 - a. Locate critical points (Points of Inflection) on your f'(x) graph
 - i. Points of Inflections are the relative max (hills) and relative mins (valleys) of your f'(x) graph
 - b. Label critical point on your sign line
 - i. Where f'(x) graph is increasing(rising), use + and ∪ to indicate concave up
 - ii. Where f'(x) graph is decreasing(falling), use - and ∩ to indicate concave down
5. Sketch f''(x) graph
 - a. Plot critical points on the graph as x - intercepts (POI and where f''(x) = 0)
 - b. Sketch portions of graph above the x-axis (concave up) or below x-axis (concave down) using the information on your sign line.

3. "Morgan's Method"

X - x-ints	f(x)	f'(x)	f''(x)
M - max & mins	X		
P - POI	M	X	
	P	M	X
		P	M
			P