Pg. 67-69 due today...

#61, 64, 69, 73

SECTIONS 2.3

PROPERTIES OF FUNCTIONS

OBJECTIVE 1

DETERMINE EVEN AND ODD FUNCTIONS FROM A GRAPH

A function f is EVEN if, for every number x in its domain, the number -x is also in the domain.

$$f(-x) = f(x)$$

For an EVEN function, for every point (x,y) on the graph, the point (-x,y) is also on the graph.

A function f is ODD if, for every number x in its domain, the number -x is also in the domain and

x	y
-1	-1
0	0
1	1
2	2

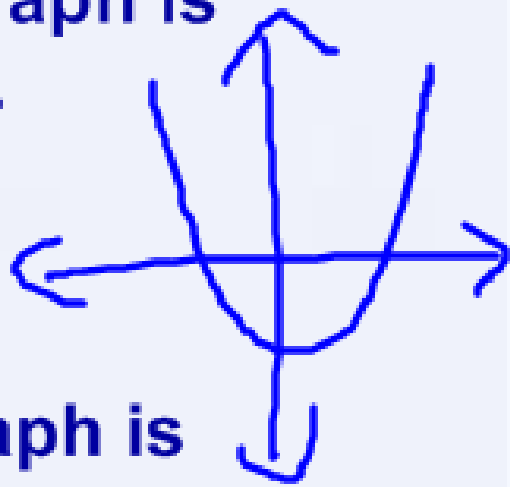
$$f(-x) = -f(x)$$

x	x
-3	-3
-2	-2
0	0
1	1
2	2

For an ODD function, for every point (x,y) on the graph, the point (-x, -y) is also on the graph.

Theorem:

A function is even if and only if its graph is symmetric with respect to the y-axis.



A function is odd if and only if its graph is symmetric with respect to the origin.

$(x, y) \rightarrow (-x, -y)$

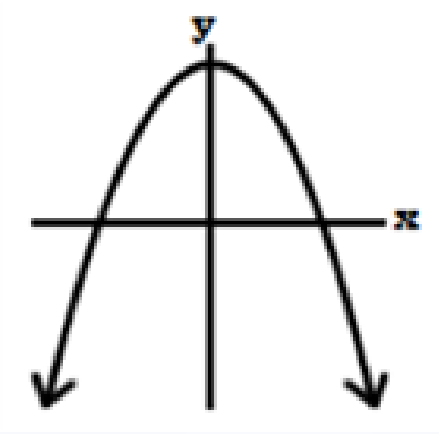
$(2, 3) \rightarrow (-2, -3)$

Example...

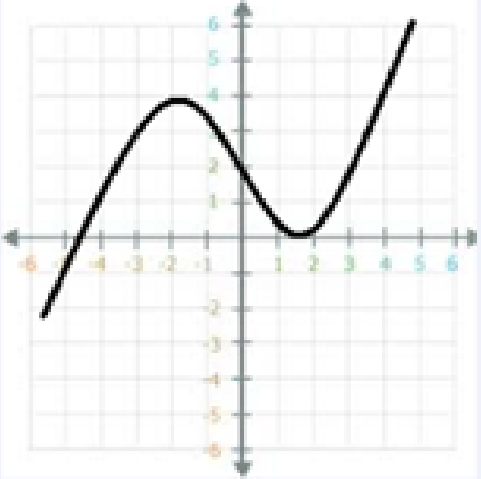
Determine EVEN and ODD functions from the graph

Determine whether each graph given is an even function, an odd function, or a function that is neither even nor odd.

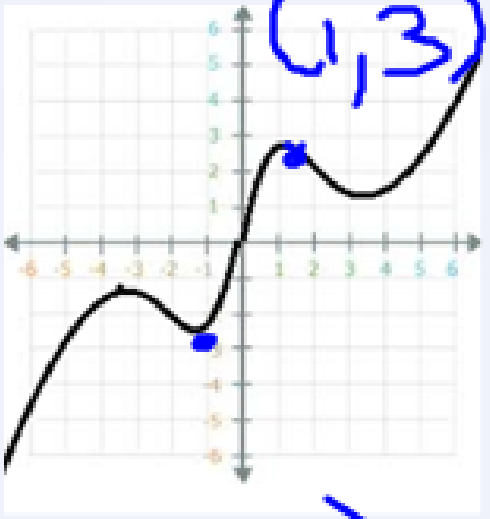
odd



even



neither



(1, 3)

(-1, -3)

OBJECTIVE 2

IDENTIFY EVEN AND ODD FUNCTIONS FROM THE EQUATION

Example...

Identifying EVEN and ODD functions

Use the graphng utility to conjecture whether each of the following functions is even, odd, or neither. Verify the conjecture algebraically. Then state whether the graph is symmetric with respect to the y-axis or with respect to the origin.

$f(x) = -3x^4 - x^2 + 2$

$g(x) = 5x^3 - 1$

$h(x) = 2x^3 - x$

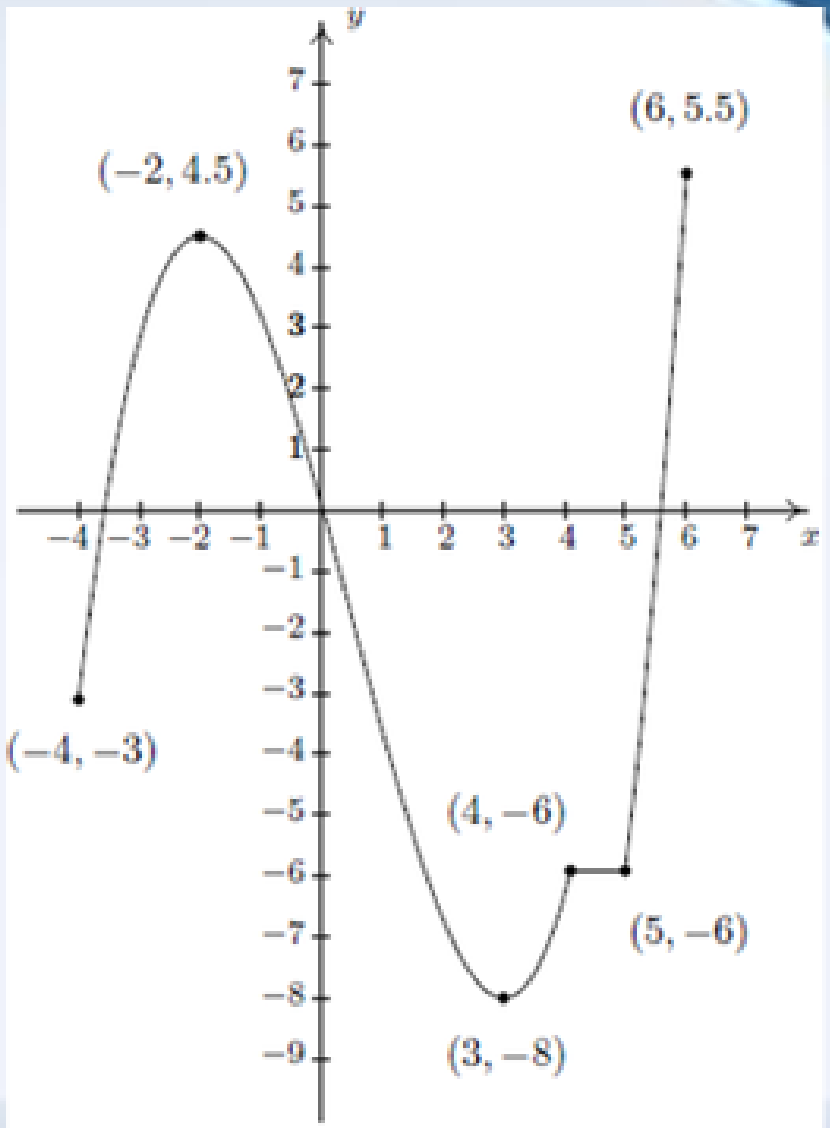
OBJECTIVE 3

USE A GRAPH TO DETERMINE WHERE A FUNCTION IS INCREASING, DECREASING, OR CONSTANT

Example...

Determine where a function is increasing, decreasing, or constant from its graph.

Where is the function increasing?

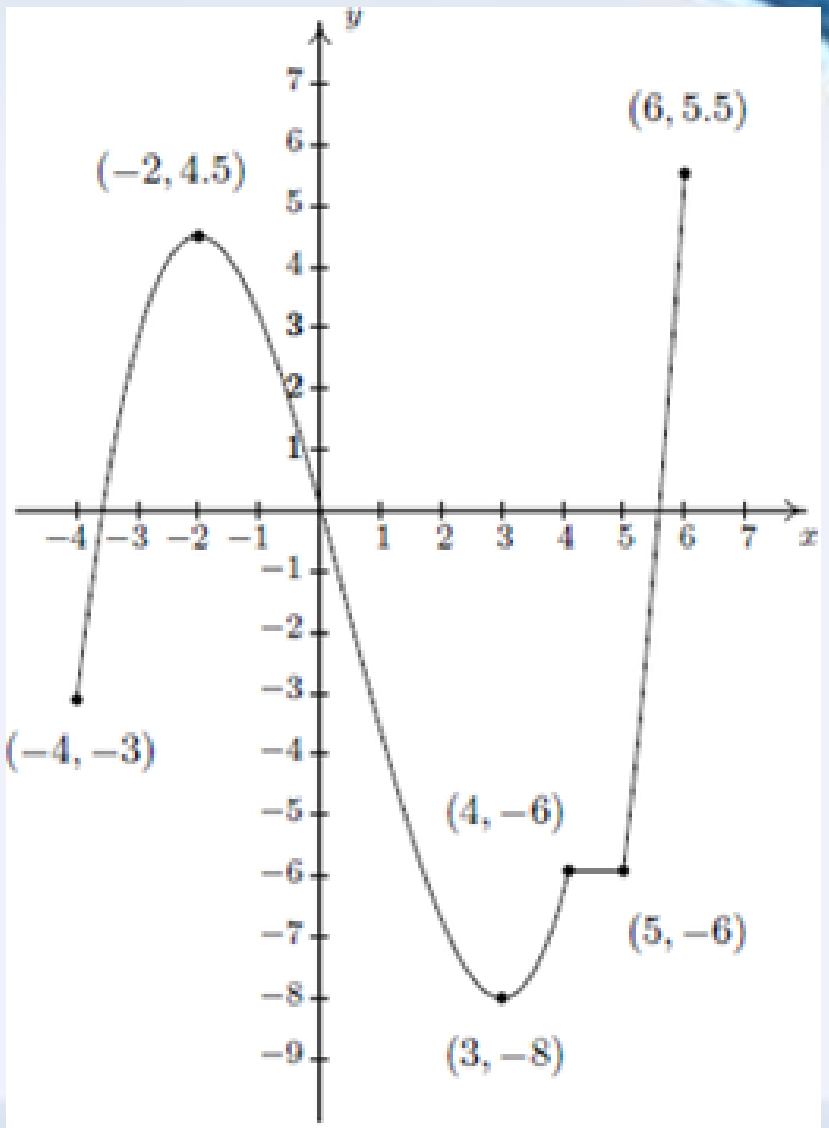


The graph of $y = f(x)$

Example...

Determine where a function is increasing, decreasing, or constant from its graph.

Where is the function decreasing?

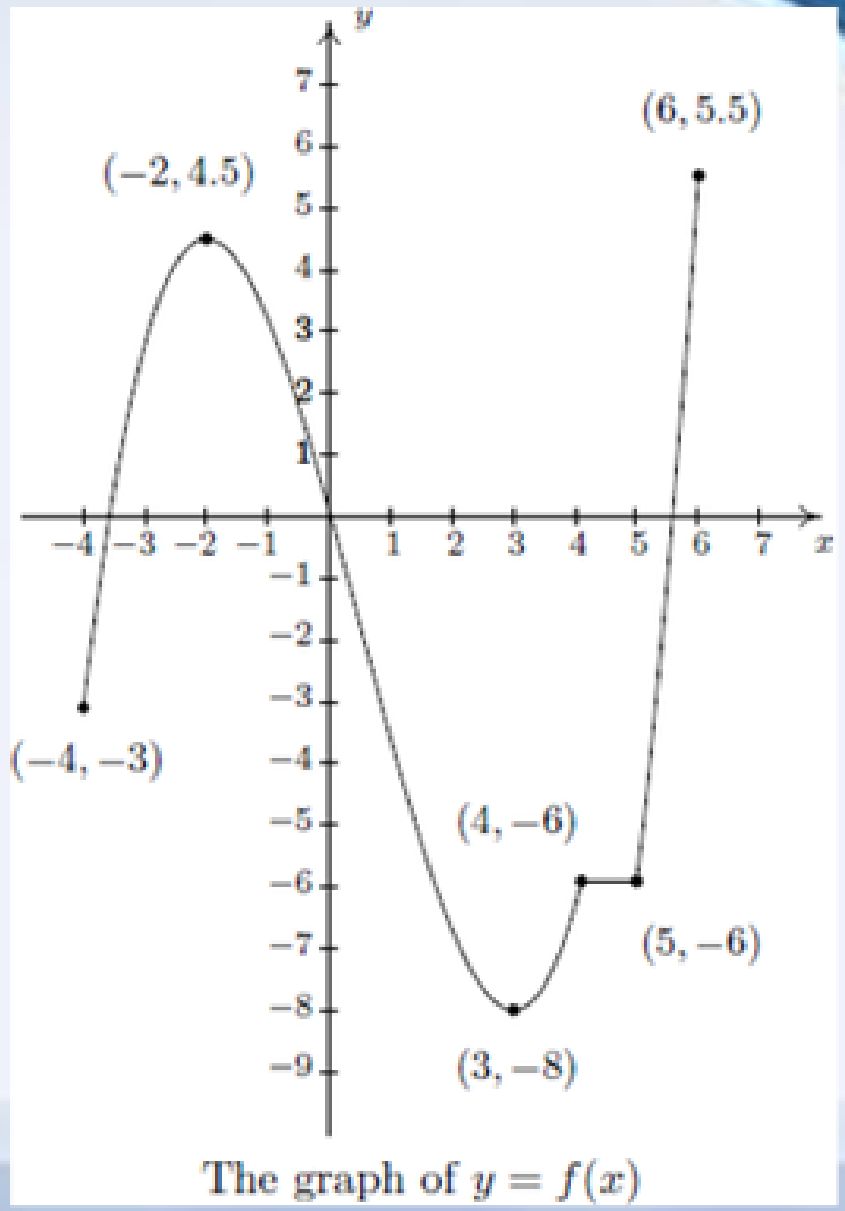


The graph of $y = f(x)$

Example...

Determine where a function is increasing, decreasing, or constant from its graph.

Where is the function constant?

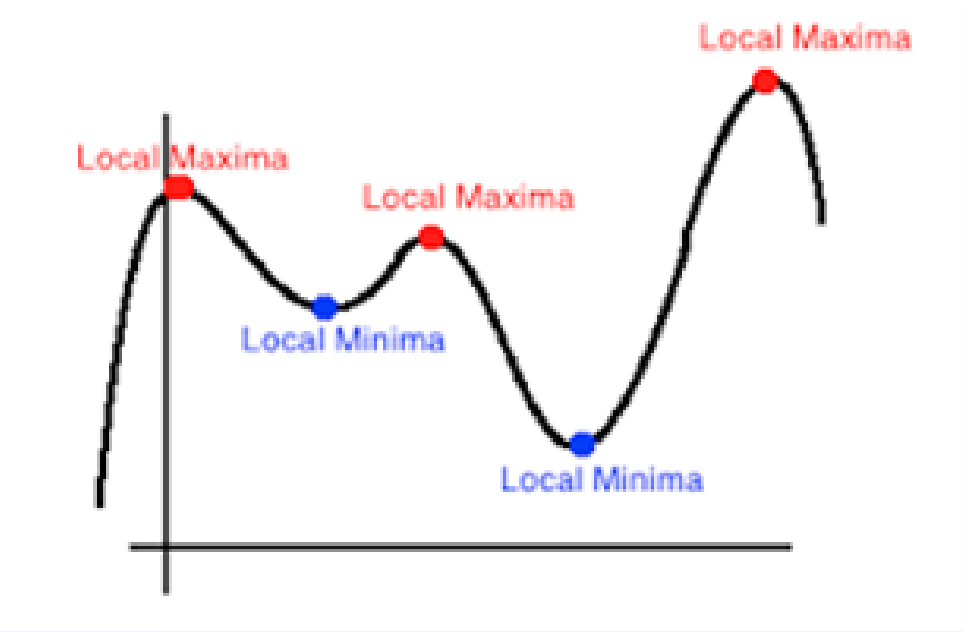


The graph of $y = f(x)$

OBJECTIVE 4

USE A GRAPH TO LOCATE LOCAL MAXIMA AND LOCAL MINIMA

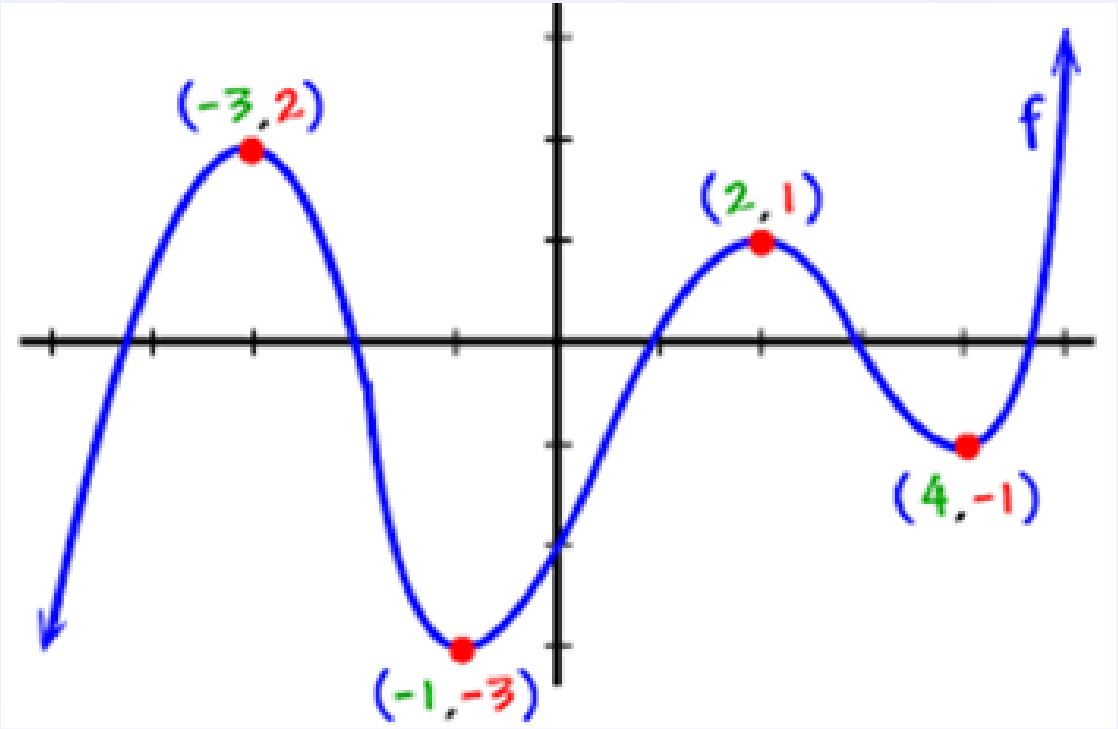
The Local Maxima is every high peak of a graph.
The graph will go from increaing to decreasing.
The point of change is our local maxima.



The Local Minima is every low point of a graph.
The graph will go from decreasing to increasing.
The point of change is our local minima.

Example...

Finding the local maxima and local minima from the graph of a function and determine where the function is increasing, decreasing, or constant.

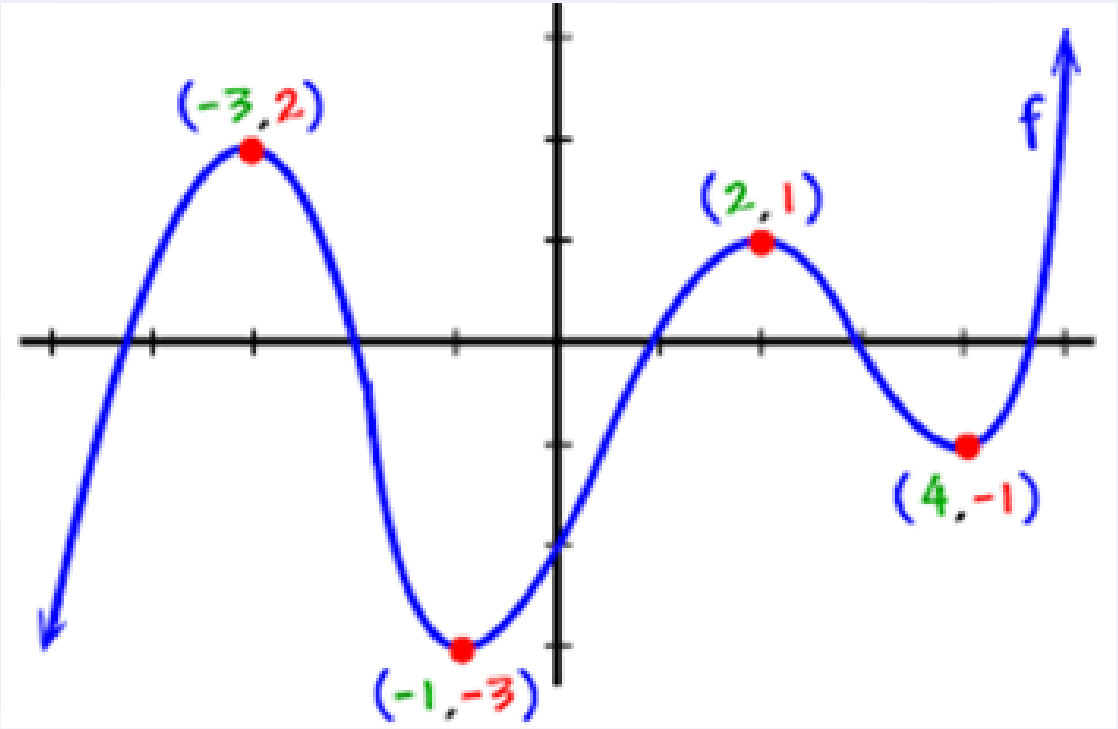


(a) At what number(s), if any, does f have a local maximum?

(b) What are the local maxima?

Example...

Finding the local maxima and local minima from the graph of a function and determine where the function is increasing, decreasing, or constant.

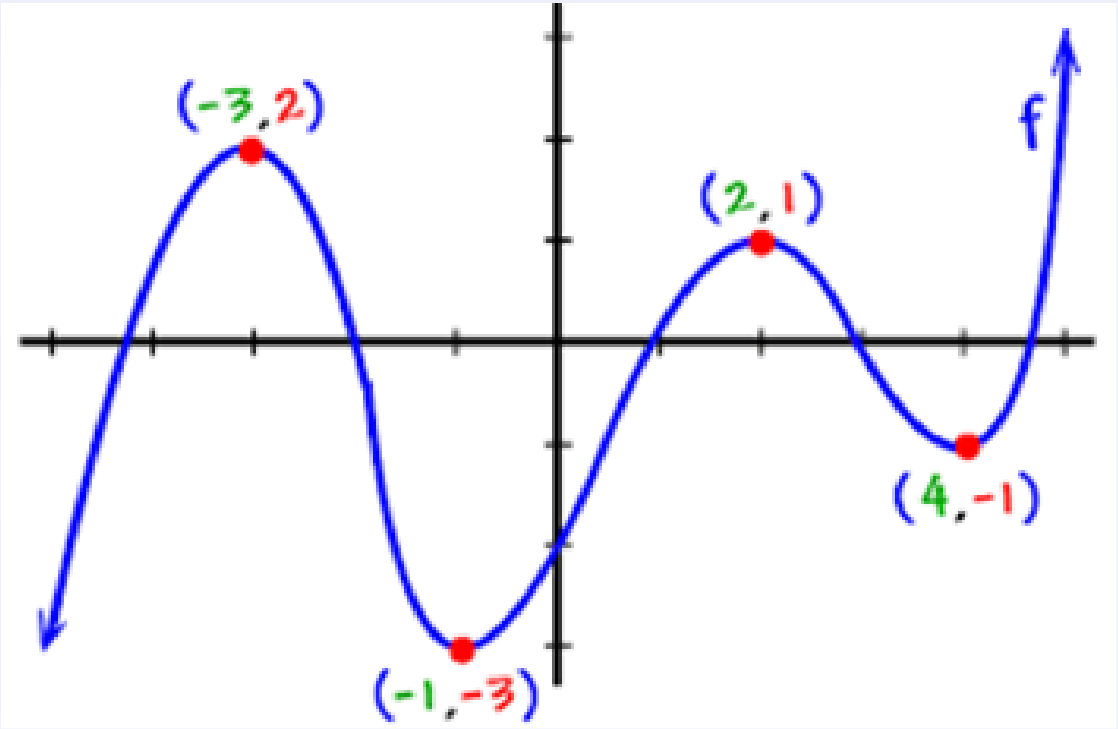


(a) At what number(s), if any, does f have a local Minimum?

(b) What are the local minima?

Example...

Finding the local maxima and local minima from the graph of a function and determine where the function is increasing, decreasing, or constant.



List the intervals on which f is increasing, List the intervals on which f is decreasing.

QUIZ WEDNESDAY

Work on Review Packet