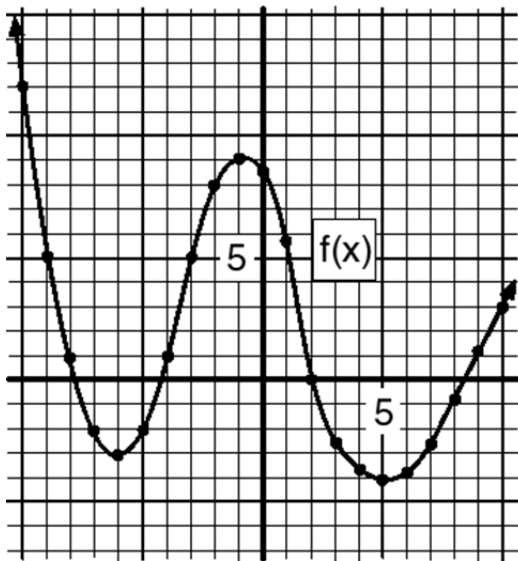


# Increasing and decreasing functions

NAME:

1. The function  $f(x)$  is below. Complete the table by finding the  $f(x)$  values for the given values of  $x$ . The points are plotted to help you. Round answers to the nearest tenth.



$x$	$f(x)$ or $y$		$x$	$f(x)$ or $y$
-10			0	
-9			1	
-8			2	
-7			3	
-6			4	
-5			5	
-4			6	
-3			7	
-2			8	
-1			9	
			10	

2. Notice how the  $y$  values in the table get smaller (decrease) as  $x$  goes from  $-10$  to  $-6$ , then the  $y$  values start to get bigger (increase). Go back to the table on page 1 and mark where the  $y$  values are increasing and where they are decreasing. Place a star next to each  $x$  value that is a local maximum or minimum. Write those  $x$  values down here.

3. When we talk about where a graph increases or decreases, **we look at what is happening to the  $y$  values but we write down the intervals of  $x$  values** where we see these increases and decreases. The local maximums and minimums will be the endpoints of these intervals.

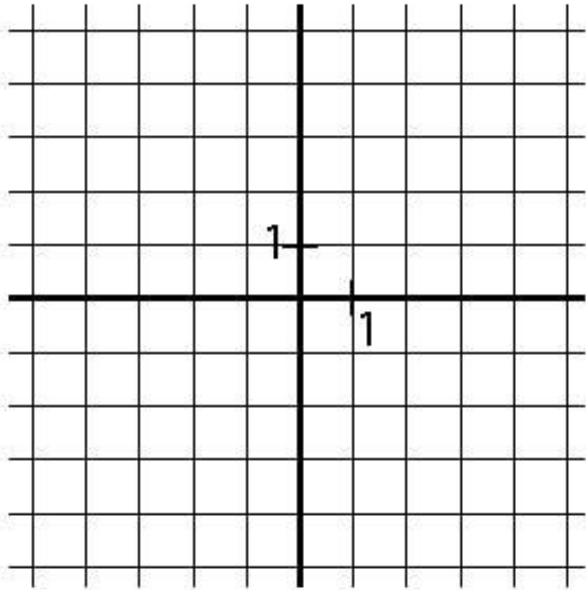
Going from left to right, determine the intervals of  $x$  where the graph is increasing or decreasing. Write your answers in interval notation.

(Hint: Since the graph is assumed to go on forever at the left and right ends, we say the graph decreases on the interval  $(-\infty, -6)$  and also increases on the interval  $(5, \infty)$ . Again, these are  $x$  values. Notice we use the symbols for negative and positive infinity. Include these intervals in your answer.)

Decreasing:

Increasing:

4. Use your grapher to graph  $y = .25x^4 + .3x^3 - .9x^2 + 3$ . Use the same window as the graph paper below represents so it will be easier to sketch. Use the calculator's Max and Min functions to find the  $x$  values of the maximum and minimum points on the graph (the humps; you should see three). Label the  $x$  values of these points on your graph. Round to two decimal places.



5. Now write (in interval notation) the intervals of  $x$  values where the graph is increasing or decreasing. I usually start at the far left and go towards the right. Round your numbers to two decimal places.

Decreasing:

Increasing: