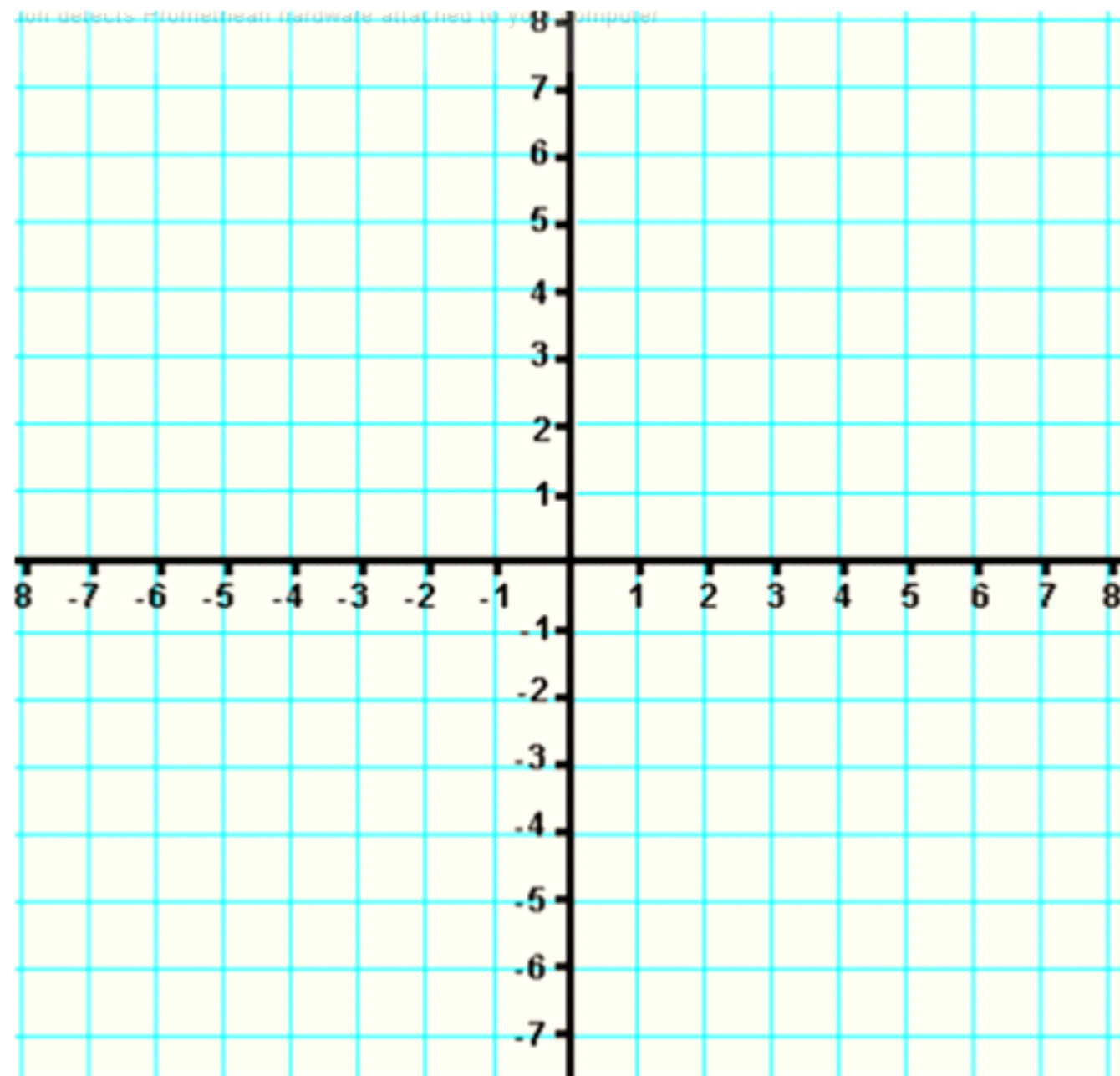


**Bell Activity: Graph on m'plot**



$$f(x) = \begin{cases} x^2 + 4x, & x < 0 \\ -3/2x, & 0 \leq x < 2 \\ 3, & x \geq 2 \end{cases}$$

**No GUT!**



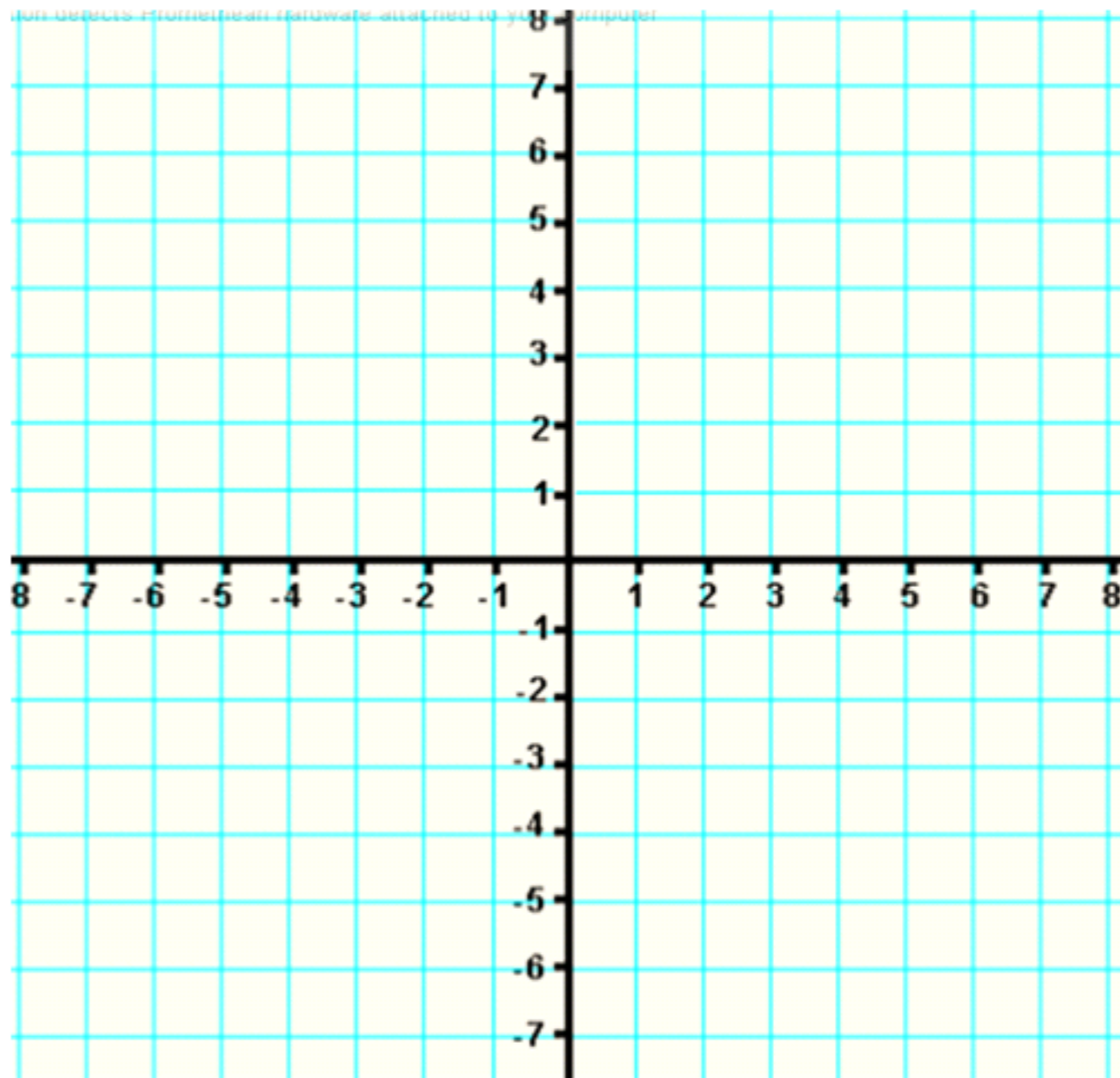
Now graph with GUT:  $Y1 = (x^2 + 4x)/(x < 0)$

$Y2 = (-3/2x)/(0 \leq x \text{ and } x < 2)$

$Y3 = (3)/(x \geq 2)$

**Graph:**

$$f(x) = \begin{cases} 1 - x^2, & x \leq 1 \\ 2, & 1 < x \leq 3 \\ 2x - 4, & x > 3 \end{cases}$$



Use the graph of  $f(x)$  to find:

1. domain of  $f$

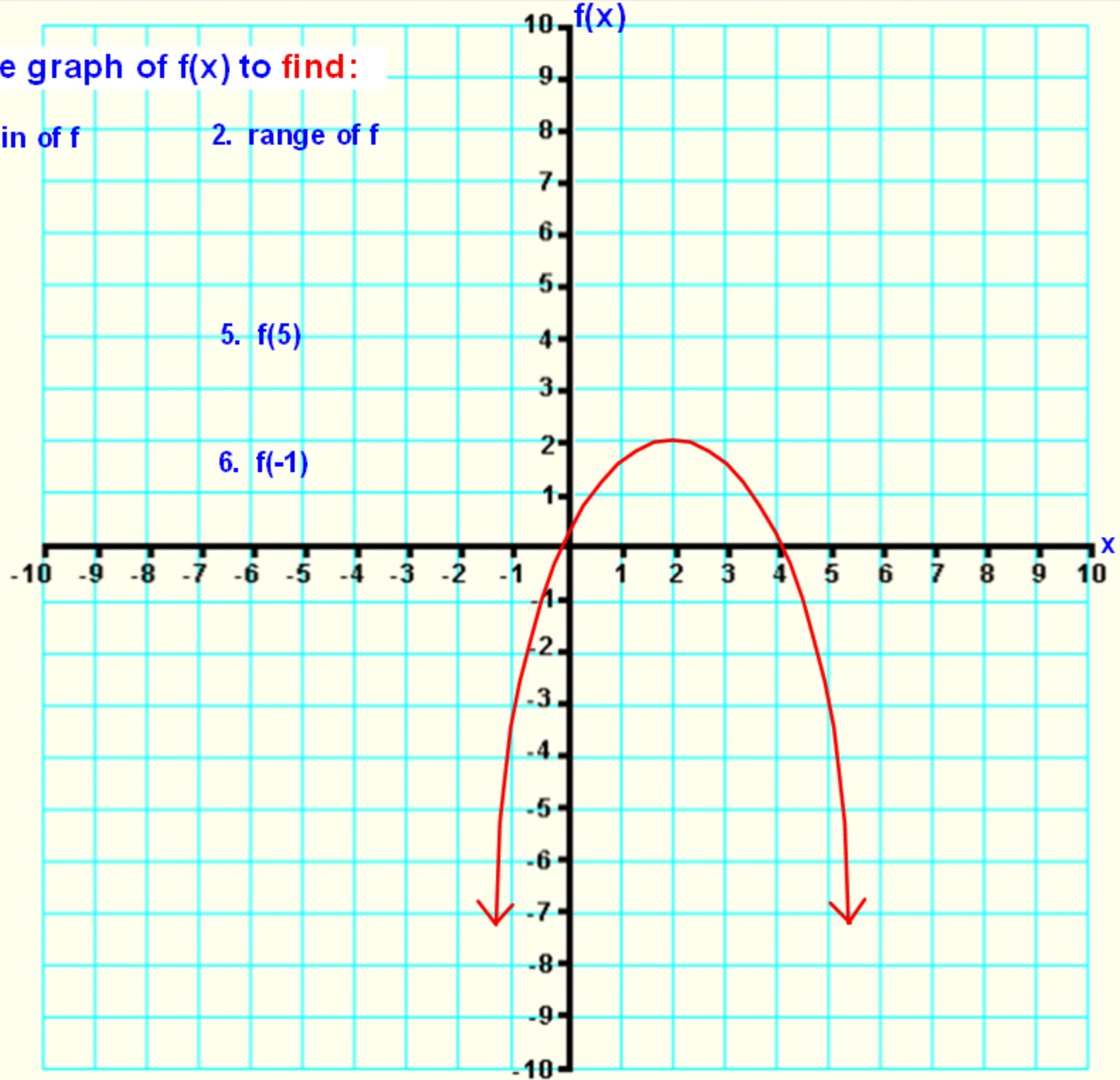
2. range of  $f$

3.  $f(2)$

5.  $f(5)$

4.  $f(0)$

6.  $f(-1)$



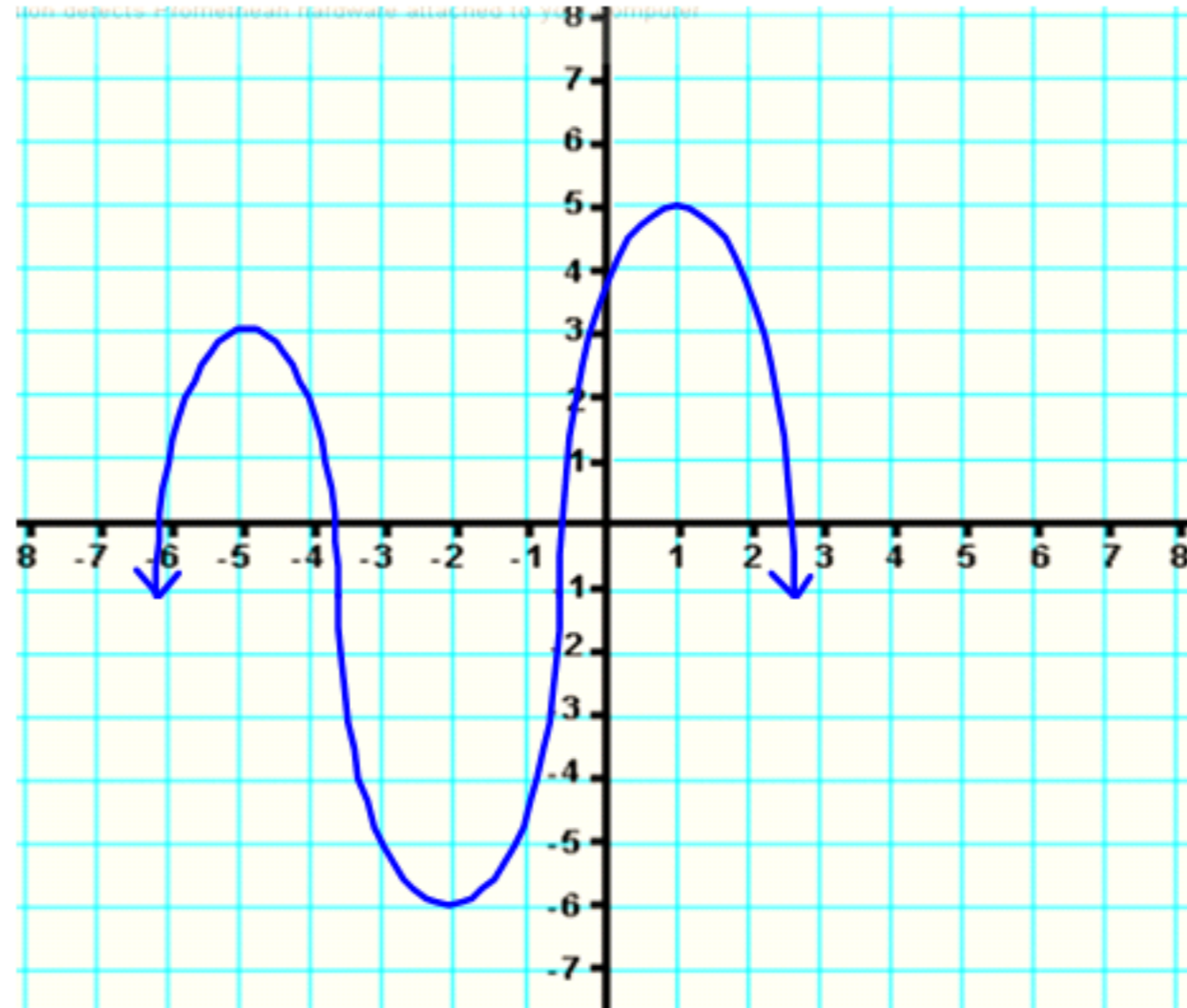
On which intervals of x is  $f(x)$  increasing and decreasing?

increasing:

decreasing:

Read it **LEFT** to **RIGHT**

NOTE: You must state the **x-intervals** for which the y values are inc/dec



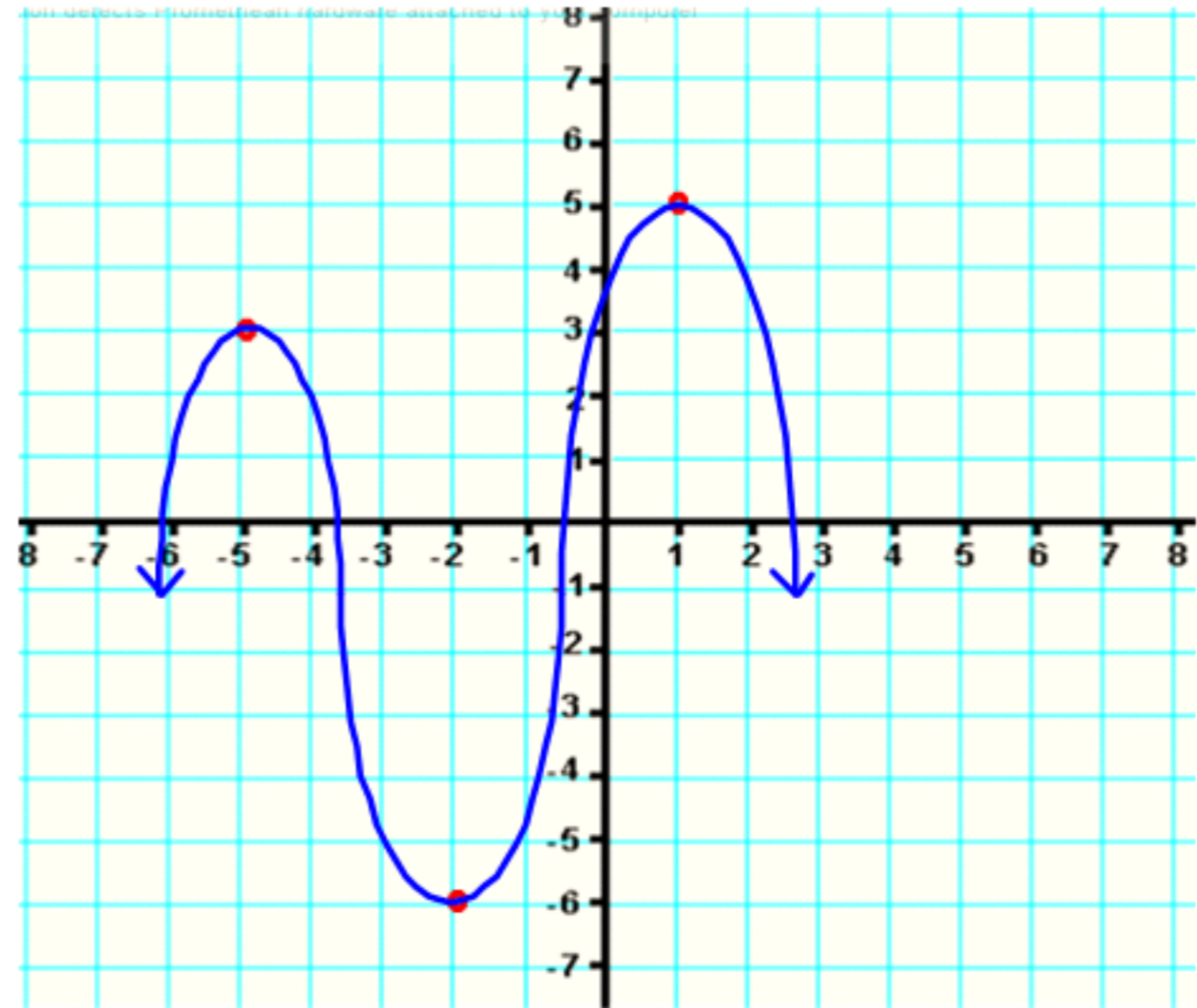
## Approximate the relative max and min of the graph

What does  
"relative"  
mean?

"local" max/min is  
sometimes used

relative maximums:

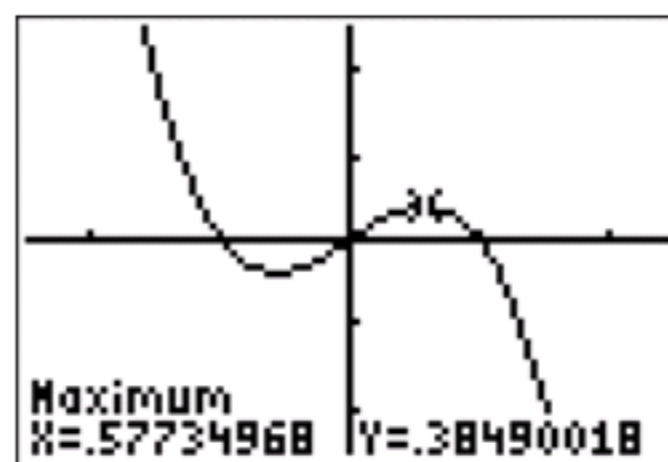
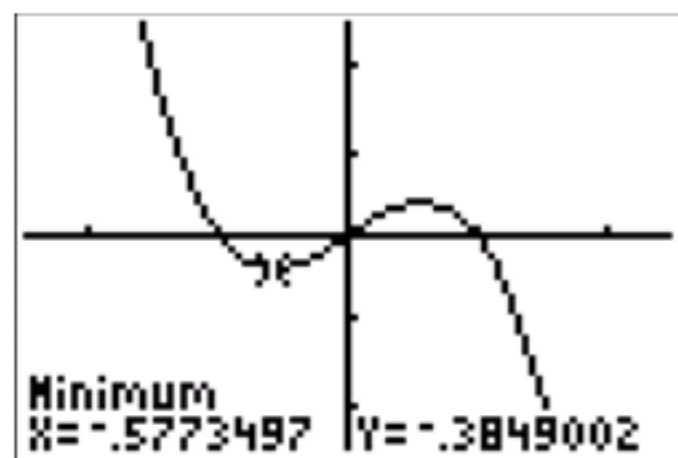
relative minimums:



Use your GUT to approximate the **relative** max and min of

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

What does  
"relative"  
mean?



Also discuss increasing and decreasing... on which intervals of x is  $f(x)$  increasing and decreasing?

DEC:  $(-\infty, -0.577)$ ,  $(0.577, \infty)$   
Decreasing?

INC:  $(-0.577, 0.577)$   
Increasing?

"Step" function:  $f(x) = [x]$

means

the "greatest integer" that is less than or equal to  $x$

**EXAMPLES:**

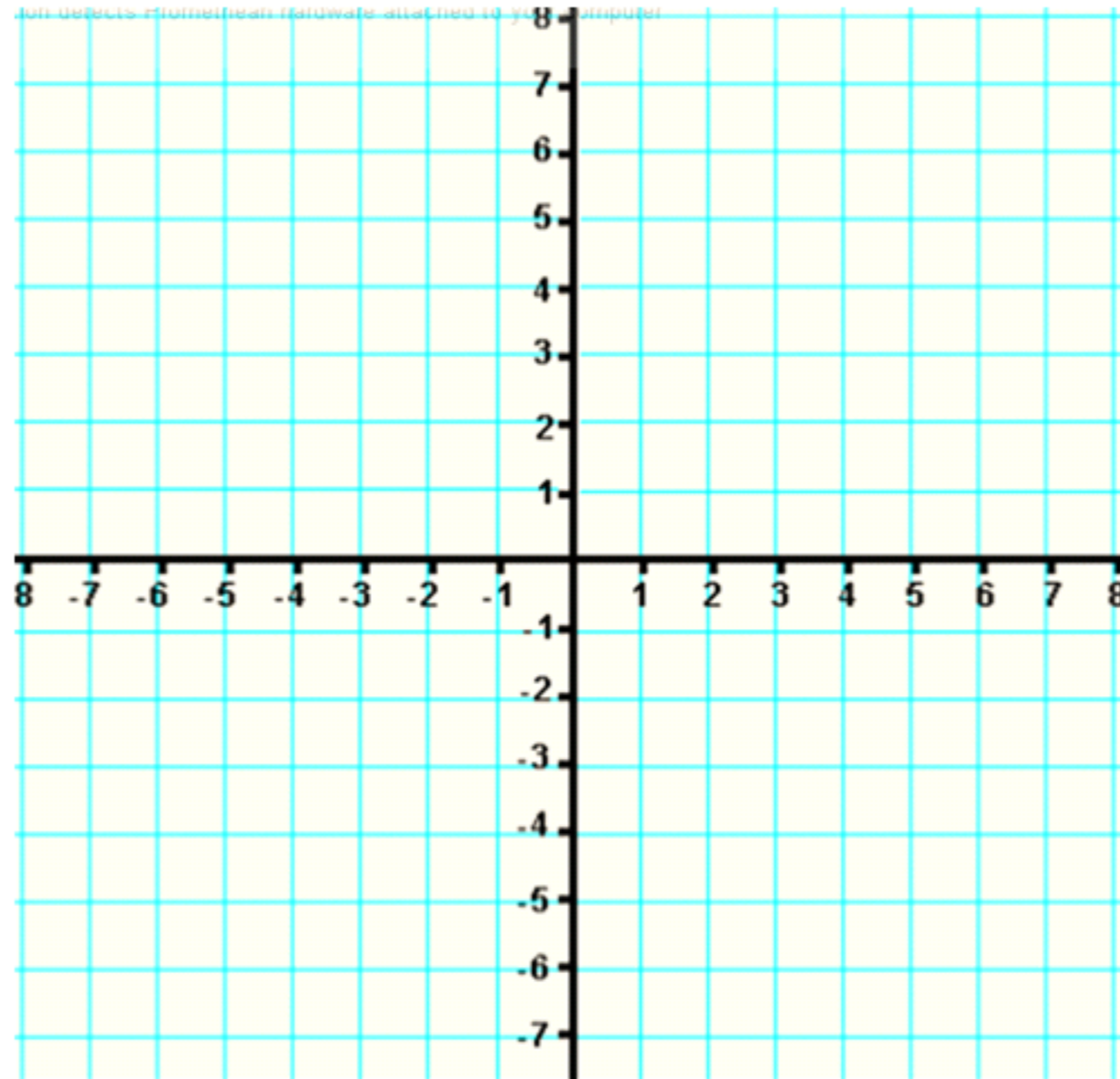
$f(1.5) = \blacksquare$

$f(1) = \blacksquare$

$f(2.7) = \blacksquare$

$f(-1.5) = \blacksquare$

$f(-.5) = \blacksquare$



Ask: "What is the largest integer that is less than or equal to 1.5?"  $\rightarrow$  There are MANY integers less than 1.5...what is the largest?

see ex 7 in text

Explain directions for # 73-79

Where is  $f(x) \geq 0$ ?

#75--  $f(x) = x^2 - 9$

$f(x) = ?$

