Day 2 - Notes

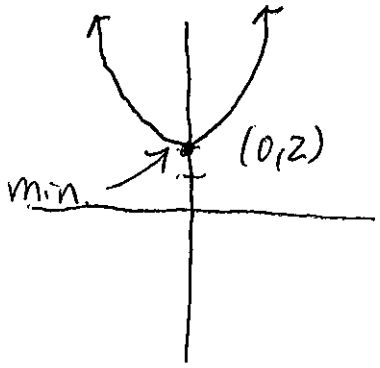
Now that we've been introduced to the tool-kit functions, let's look deeper into some characteristics of functions.

Maximum vs. Minimum. [extremes]

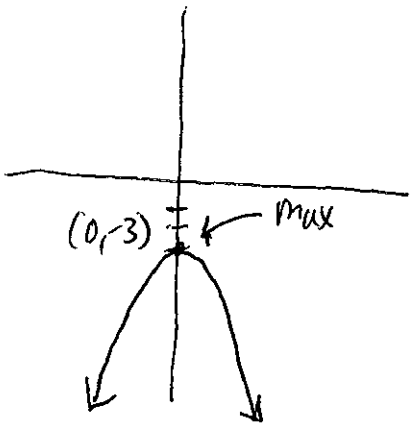
Why? Extreme points help us to determine when the range of data switches direction. Used to optimize problems.

profit
cost
robots!

ex) $f(x) = x^2 + 2$

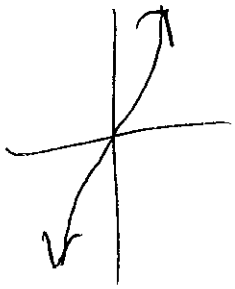


ex) $g(x) = -2x^2 - 3$

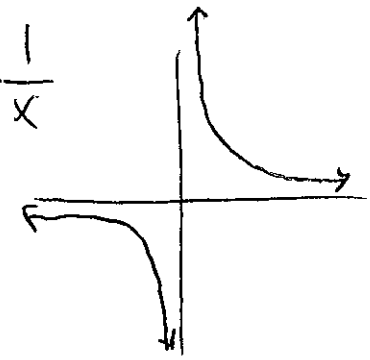


Functions with no max/min

ex) $h(x) = x^3$



$t(x) = \frac{1}{x}$

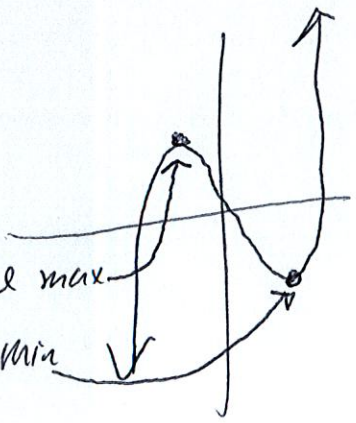


Local max & min

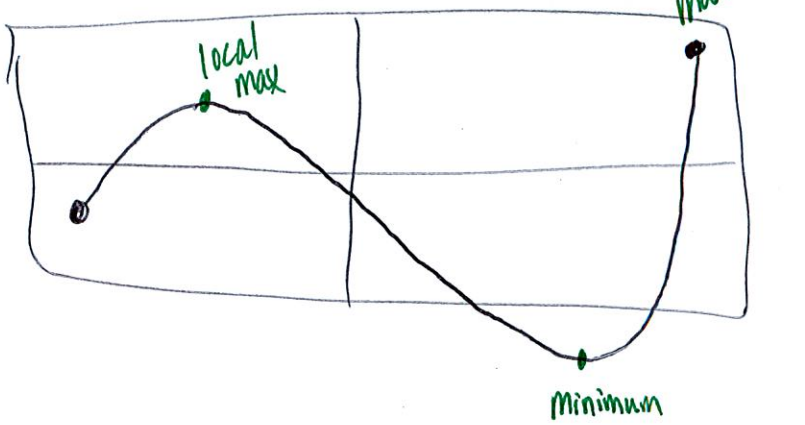
Let's look at $f(x) = x^3 + 4x$

It has no max or min

BUT... it does have a local max and local min

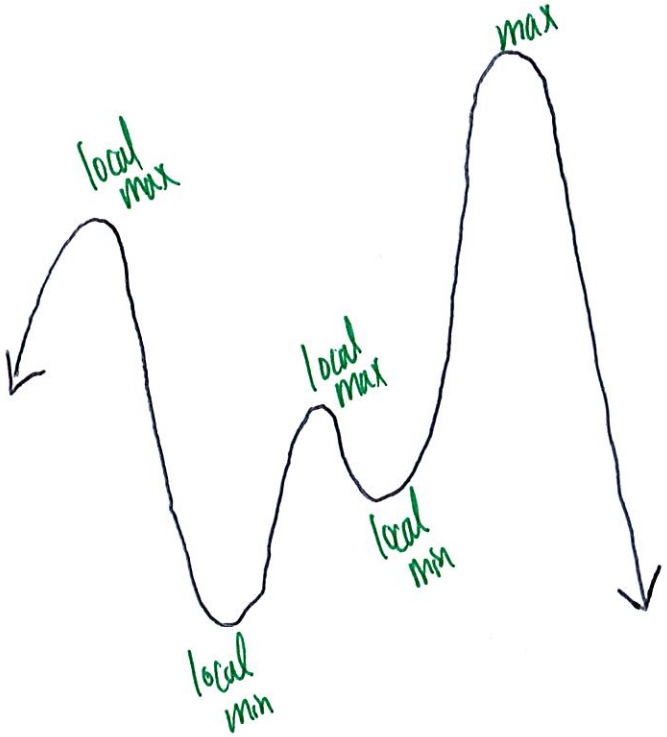


Practice:



Label max/min & local

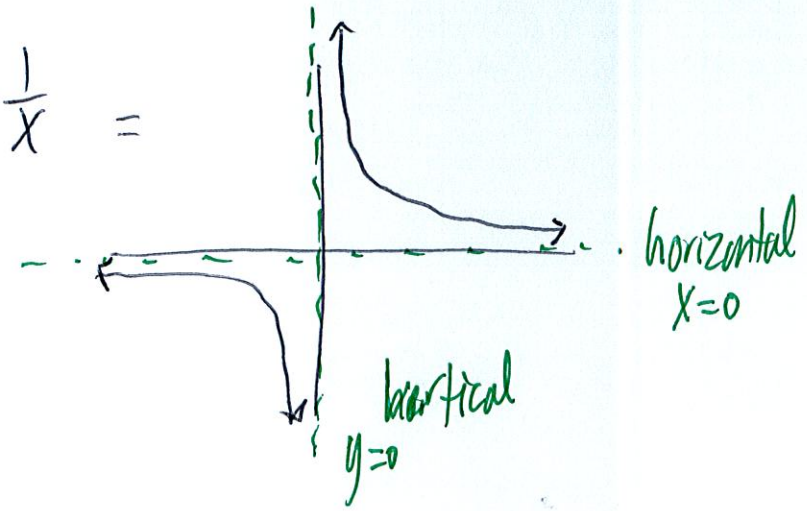
Practice.



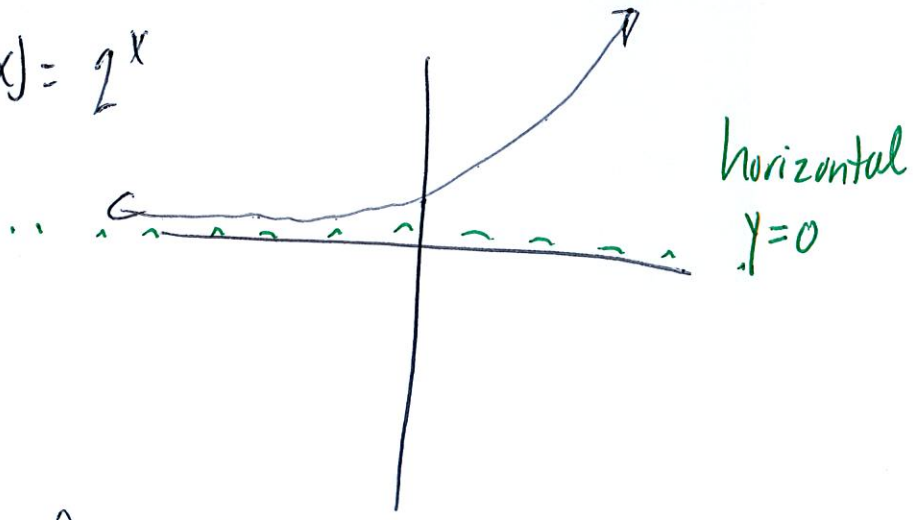
Asymptotes

A line that approaches a given curve but does not meet it at any point.

$f(x) = \frac{1}{x} =$



$g(x) = 2^x$

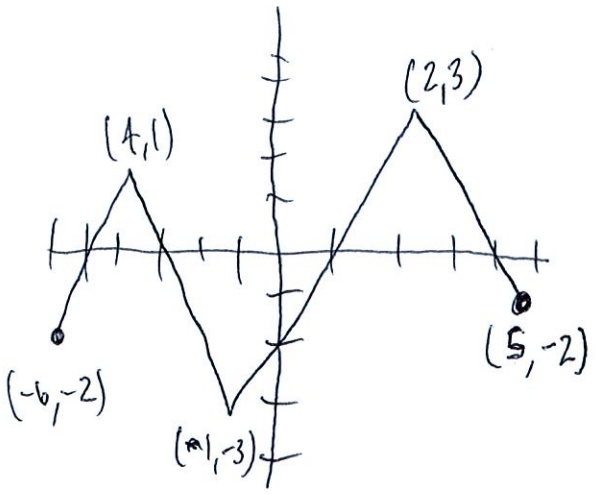


...can help determine Domain, Range.

Domain, set of values that you input into the function

Range, the result (output) of a function.

Practice:



Domain: $[-6, 5]$

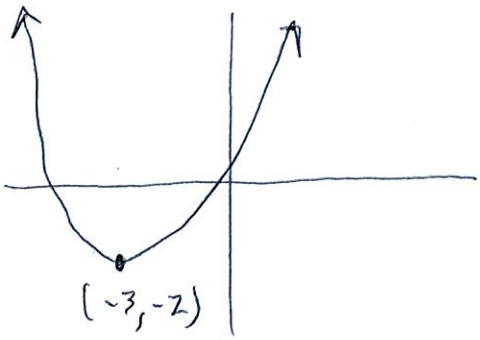
Range: $[-3, 3]$

Worksheet

Increase, Decrease

A function increases when the y values increase as the x values increase.

A function decreases when the y values decrease as the x values increase.



Increase: $[-3, \infty)$

Decrease: $(-\infty, -3]$