Math 1110: **Extreme Value Theorem** Pre-class for Oct 17 (Wed)

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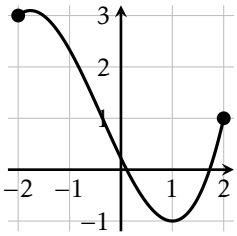
The goal of this activity is to inquire about the following question: when can we assure that a function will have an "absolute" maximum and minimum? What conditions must be met?
These is an important question because if we look the for minimum or maximum (e.g. we want to minimize the cost of production of an item) it would be better if we new beforehand that such a minimum or maximum exists!

1. Examples of functions

For each of the functions graphed below, determine:

- the domain of the function,
- the continuity or discontinuity of the function (and if discontinuous, at what point(s) is it so),
- for what value(s) of x does the function attain a maximum or minimum and the value of the function at that/these point(s).

a)

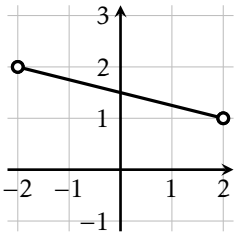


Domain:

Point(s) of discontinuity:

Min and Max:

b)

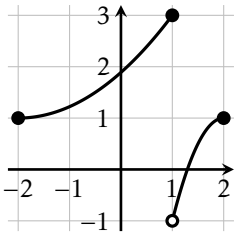


Domain:

Point(s) of discontinuity:

Min and Max:

c)

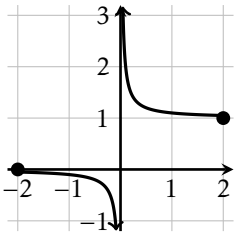


Domain:

Point(s) of discontinuity:

Min and Max:

d)



Domain:

Point(s) of discontinuity:

Min and Max:

2.

Which one(s) of the above function(s) have both a minimum and maximum?
What are the properties of this/these function(s)? When can we assure that a function will have absolute min and max?