Lesson 22

Read 4.7

Optimization

Optimization problems

Optimization problems are problems where you are asked to maximize or minimize a certain quantity.
To solve an Optimization problem you need to :

1. Write a function $f(x)$ to maximize (i.e. find global max) or minimize (i.e. find global min)
2. Determine the domain D of f that you need for your problem.
3. If $D = [a, b]$ you need to use the method for finding the global max/min of a function over a closed and bounded interval (see Sec. 4.1)
4. Otherwise you need to find the local max/min of f and pick the global max/min and justify your choice.

Setup for optimization problems

1. Minimize/ maximize which **quantity** ?
2. Quantity $= f(?)$ **choose your variable** x
3. Write a formula for quantity $= f(x)$
4. Choose your **domain**.
5. Use techniques of Sec 4.1 or 4.3 to find global max/min

Find two numbers whose sum is 20 and whose product is maximum.

Find the maximum possible area of a right triangle ABC that has vertex A at the point $(1, 0)$, vertex B somewhere in the top half of the unit circle and vertex C on the x-axis , vertically below vertex B.