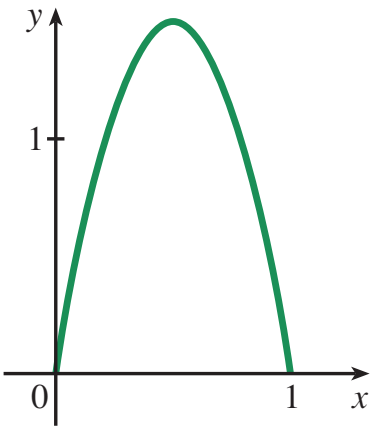
Arc Length Contest

Find a formula for a function f with domain $[0,1]$ that satisfies:

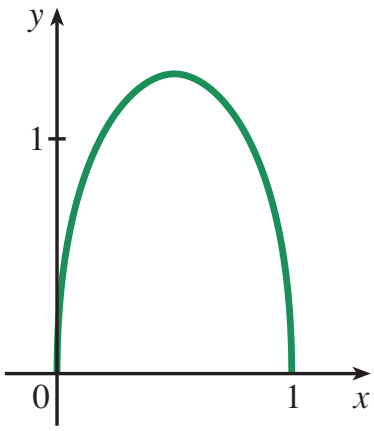
- $f(0)=0$ and $f(1)=0$
- f is continuous on $[0,1]$
- $f(x)\geq 0$ on $[0,1]$
- the area under the graph of f for $0\leq x\leq 1$ is equal to 1

The winning entry is the one with the smallest arc length.

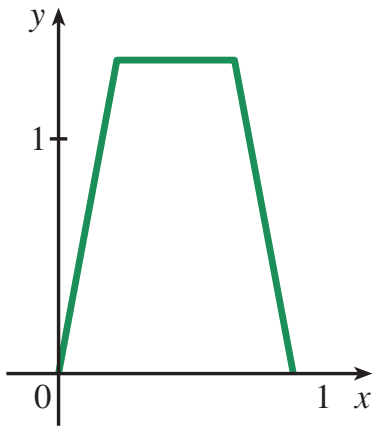
Some examples:



$L\approx 3.249$



$L\approx 2.919$



$L\approx 3.213$