UNIVERSITY OF WISCONSIN
PLATTEVILLE
DEPARTMENT OF MATHEMATICS

Problem of the Week #3

(Spring 2018)

We say a function f has *width* d if there is a horizontal line segment of length d whose endpoints are both on the graph $y = f(x)$. For example, if $f(x) = x^3 - x$, then f has width 2 because $(-1, 0)$ and $(1, 0)$ are both on the graph of f.
Suppose that g is a continuous function with domain $(-\infty, \infty)$ that has both an absolute maximum and an absolute minimum. Is it true that g must have width d for every $d > 0$?

[Please fully explain your answer.]

Solutions should be submitted to Cinda Furry, in Gardner Hall 435, by 4:00 P.M. on Wednesday, February 14, 2018.