

Week 3, Due Fri 10/18

1. Spivak, Chapter 3, Problems: 6, 8, 13.
2. Spivak, Chapter 4, Problem 5 (pictures alone suffice; let $a = b = 1$ in part (ii)).
3. Say that a function $f(x)$ with domain Ω and that takes values in Ω can be “halved” if there exists a function $g(x)$ such that $g(g(x)) = f(x)$.
 - (a) Show that the function $f(x) = x^r$ on the domain $\Omega = (0, \infty)$ can be halved if $r > 0$.
 - (b) (*) Find some function $f(x)$ on $(0, \infty)$ with positive values that cannot be halved. Warning: there is no requirement or assumption that $f(x)$ is continuous, whatever that means.
4. (*) Spivak, Chapter 4, Problem 20.