

Chapter 19: Fractal Distributions

Worksheet to accompany

David Feldman, *Chaos and Fractals: An Elementary Introduction*,
Oxford University Press, 2012

Suppose the probability that a branch of a tree has length x is given by

$$p(x) = 0.61 \frac{1}{x^2} . \quad (1)$$

1. What is the probability that a branch has length 2?
2. What is the probability that a branch has length 4?
3. What is the probability that a branch has length 8?
4. How many times more likely are branches of length 2 compared to branches of length 4?
5. How many times more likely are branches of length 4 compared to branches of length 8?

Now suppose that in a different tree, the probability of that a branch has length x is given by

$$p(x) = \left(\frac{1}{3}\right) \left(\frac{2}{3}\right)^{x-1} . \quad (2)$$

Answer the above five questions for this other tree.