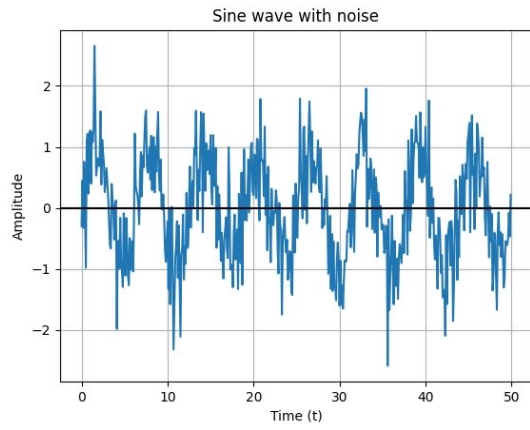
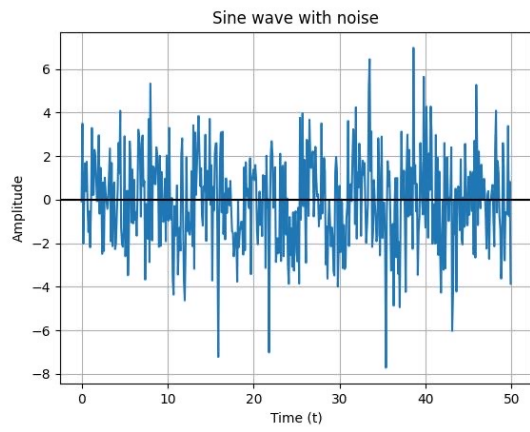


$$f(t) = \sin \omega t, \\ t \geq 0$$



$$X(t) = \sin \omega t + N_1(t)$$

noise process



$$X(t) = \sin \omega t + N_2(t)$$

Modeling Random Experiments: An

Overview

- The outcome of a random experiment is not known in advance, but the set of all possible outcomes is assumed to be known.
- Probabilities will be assigned to sets of outcomes, called events.

- Probability will be a set function assigning a number in $[0,1]$ to each event.

Some mathematical preliminaries

- Basic integration and differentiation

- polynomials
- e^{ax} , constant a
- chain rule

$$\frac{dw}{dx} = \frac{dw}{dv} \frac{dv}{dx}$$

— Integration by parts
The expected lifetime
of a device under
one common model

is $\lambda \int_0^{\infty} x e^{-\lambda x} dx$
for some $\lambda > 0$

• Infinite series