Mathematical listening comprehension test

The sampling frequency is $1/\delta = 44100\,\mathrm{Hz}$, and the unit of t is second.

Recognize the following tunes:

(a) White noise.

(b) Topologist's sinusoid.

(c) **Harmony of spheres: $\mathbb{S}^1$ ringing.**

(d) **Harmony of spheres: $\mathbb{S}^{1000000}$ ringing.**

(e) $f(t) = \dfrac{\sin\left(40\sin(2\pi 10 t)\right)}{1 + \sin\sin t}$.

(f) $f(t) = \sin\left(2\pi 100 \sin^{50}\left(2\sinh\dfrac{t}{4}\right)\right)$.

(g) $f(t) = \sin\left(150 t^2 + 70\sin(2\pi\,40\sqrt{t})\right)$.

(h) $f(t) = \begin{cases} 0, & \text{if } t < 0, \\ \sin\left(4\pi t + f(t-3\delta) - \frac{t}{20}f(t-2\delta) + f(t-\delta)\right), & \text{if } t \geq 0. \end{cases}$

(i) $f(t) = \begin{cases} \sin\frac{9\pi t}{2\Delta}, & \text{if } t < \Delta, \\ \frac{1}{2}\left(f(t-\Delta) + f(t+\delta-\Delta)\cdot(S\circ f)(t-\Delta)\right), & \text{if } t \geq \Delta. \end{cases}$

   Here $\Delta = 10\,\mathrm{ms}$, and $S(t) = \mathrm{sign}\sin\sinh(100\,t)$.

Sample	1	2	3	4	5	6	7	8	9
Tune									