

1. Find $f(3^4)$ if f satisfies the recurrence relation $f(n) = 2f(\sqrt[4]{n}) + 4$ with $f(1) = 1$.

Suppose that $f(n) = 2f(\sqrt{n}) + 1$. Find a big-O estimate for $f(n)$.

Find the generating function for the ^{finite} sequence 1, 4, 16, 64, 256.

Find a closed form for the generating function of the sequence $\binom{7}{0}, 2\binom{7}{1}, 2^2\binom{7}{2}, \dots, 2^7\binom{7}{7}$.

Show that $\frac{1}{1-x-x^2-\dots-x^6}$ is the generating function for the # of ways that the sum can be obtained when a die is rolled repeatedly, and order matters.