

Hrudai Battini Hw 3

2) $a(n) - a(n-1)^2 = 0$ $a(n) = r^n$

$$r^n - r^{n^2 - 2n + 1} = 0 = r^n - r^{n^2} (r^{-2n}) r = 0 \quad \text{divide by } r^n$$

$$1 - r^{n-2+n} = 1 - r^{n-2+1/n} \quad a(n) = 1 \quad a(n-1)^2 = \frac{1}{r^2}$$

$$1 - \frac{1}{r^2} = 0 \quad r^2 - 1 = 0 \quad r = \pm 1$$

3) $a_n = r^n \rightarrow r^n - 3r^{n-1} + 2r^{n-2} = 0$ $1 - 3r^{-1} + 2r^{-2} = 0$

$$1 - \frac{3}{r} + \frac{2}{r^2} = 0 \quad r^2 - 3r + 2 = 0 \quad (r-2)(r-1) \quad r = 1, 2$$

$$a_n = c_1 r^n + c_2 2^n$$

$$a(0) = c_1 + c_2 = 2 \quad c_2 = 1, c_1 = 1$$

$$a(1) = c_1 + 2c_2 = 5$$

$a_n = 1 + 2^n$

? 4) $a(n) = r^n$ $r^n - 2r^{n-1} - 2r^{n-2} + 2r^{n-3} = 0$
 $1 - 2r^{-1} - 2r^{-2} + 2r^{-3} = 0$ $r^3 - 2r^2 - 2r + 2 = 0$ $r = 0.69, -1.17, 2.48$

5) $a(n) = r^n$ $r^n - r^{n-4} = 0$ $1 - r^{-4} = 0$ $r^4 - 1 = 0$ $(r^2+1)(r^2-1)$
 $(r^2+1)(r+1)(r-1)$ $r = 1, -1, -i, i$ $a(0) = 1, a(1) = 0, a(2) = 0, a(3) = 0$
 $\frac{1}{4} + \frac{-i^5}{4} + \frac{i^3}{4} + \frac{(-1)^2}{4}$

Lecture 3