OK to post

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Homework 3

#3 $a(n) = 3a(n-1) - 2a(n-2)$; $a(0) = 2$ $a(1) = 3$

$a(2) = 3(3) - 2(2) = 5$ $+2$

$a(3) = 3(5) - 2(3) = 9$ $+4$

$a(4) = 3(9) - 2(5) = 17$ $+8$

$a(5) = 3(17) - 2(9) = 33$ $+16$

$a(n) = 2^n + 1$ for $n \geq 0$

#4 $a(n) = 2a(n-1) + 2a(n-2) - 2a(n-3)$ $a(0) = 3$ $a(1) = 2$ $a(2) = 6$

$a(3) = 10$

$a(4) = 28$ No discernable pattern, maple didn't solve realistically either

$a(5) = 64$

#5 $a(n) = a(n-4)$ $a(0) = 1$ $a(1) = 0$ $a(2) = 0$ $a(3) = 0$

$a(4) = 1$ Since a alternates every k where k/4 = an integer

$a(5) = 0$ the first thing that comes to mind is imaginary numbers

$a(6) = 0$

$a(7) = 0$ Since it alternates from 1 & 0 we need a function of i

$a(8) = 1$ that equals 1 when $n = 4k$, & 0 everywhere else

$$a(n) = \frac{1}{4} + \frac{(i)^n}{4} + \frac{(-i)^n}{4} + \frac{(-1)^n}{4}$$