

METU Mathematics Department
MATH 112: Answers to Exercise Set VII

1. ~~$a_n = 3^n + n(3)^{n-1}, n \geq 1$~~
2. $a_n = 3^n + n(3)^{n-1}, n \geq 1.$
3. $a_n - 4a_{n-1} - 7a_{n-2} + 10a_{n-3} = 0, n \geq 3.$
4. (a) $c_1 2^n + c_2 (-2)^n.$
 (b)
 (c) $a_n = 3(2)^n + (-2)^n + n(2)^{n-1}, n \geq 0.$
5. (a) $a_n = (1/4)n^4 - (1/2)n^3 + (1/4)n^2 + n, n \geq 0.$
 (b) $a_n = (5/4)(-1)^n + n/2 - 1/4, n \geq 0.$
 (c) $a_n = 2(5)^n + n(5)^{n-1}, n \geq 0.$
6. (a) $a_n = (-1/8)(-5)^n + (1/8)(3)^n, n \geq 0.$
 (b) ~~$a_n = 5/4 + (1/4)(-1)^n + n^2/2, n \geq 0.$~~
7. (a) $f(n) = n^4, n \geq 1.$
 (b) The sum $1^4 + 2^4 + \cdots + n^4$ is given by a_n for $n \geq 0.$