§5.3 Homework Solutions

1) Rewriting the RR as $a_n - a_{n-1} - 6a_{n-2} = 0$ we see the char. Equation is
$$x^2 - x - 6 = 0 \implies (x+2)(x-3) = 0 \implies x = -2 \text{ or } 3$$

So the solution is of the form $a_n = C_1(-2)^n + C_2(3)^n$
But $a_0 = 1 \implies C_1 + C_2 = 1$ and $a_1 = 3 \implies -2C_1 + 3C_2 = 3 \implies$ Thus $C_1 = 0, C_2 = 1$
and $\underline{a_n = 3^n}$.

7) The characteristic equation is $x^2 - 2x - 3 = 0 \implies (x+1)(x-3) = 0$. So $x = -1$ or 3
Thus solution has the form $a_n = C_1(-1)^n + C_2(3)^n$.
But $a_0 = 0 \implies C_1 + C_2 = 0$ and $a_1 = 8 \implies -C_1 + 3C_2 = 8$ giving $C_1 = -2, C_2 = 2$
and $\underline{a_n = -2(-1)^n + 2(3)^n}$.

17) The full solution is given in the back of the book. Read it carefully.