Math 3134 Recursion Problems

Find a closed formula for a_n.

1. $a_n + 2a_{n-1} - 3a_{n-2} = 0,\ a_0 = 1,\ a_1 = 5$

2. $a_n + 6a_{n-1} + 5a_{n-2} = 0,\ a_0 = 0,\ a_1 = 8$

3. $a_n - 4a_{n-1} + 4a_{n-2} = 0,\ a_0 = 2,\ a_1 = 6$

4. $a_n - 6a_{n-1} + 11a_{n-2} - 6a_{n-3} = 0,\ a_0 = 8,\ a_1 = 12,\ a_2 = 22$
   [Hint: $r = 1$ is a root of the characteristic equation]

5. $a_n + 2a_{n-1} - 3a_{n-2} = 5 \cdot 2^n,\ a_0 = 9,\ a_1 = 5$

6. $a_n + 6a_{n-1} + 5a_{n-2} = 36n,\ a_0 = 7,\ a_1 = 0$