Cases for finding the solutions of recurrence equations based on the roots of the characteristic equation

***Case 3 – roots of the characteristic equation are distinct but complex*:**

Sometimes the roots are complex . If one root is a complex conjugate of another, then the roots can be expressed as ,
$r_1 = re^{ai}$ ***and*** $r_2 = re^{-ai}$***. This gives the general solution*:**

$$t_n = c_1 r^n cosn\alpha + c_2 r^n sinn\alpha$$

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