

# DIFFERENCE EQNS SUMMARY

1st Order

eg  $T_n - 3T_{n-1} = 5$

$n=1, n=2, n=3$

$S_n = \frac{a(1-r^n)}{1-r}$

2nd Order

Homogeneous

eg.  $T_{n-2} - 3T_{n-1} + 2T_n = 0$

Inhomogeneous

eg  $T_{n-2} - 3T_{n-1} + 2T_n = 3n - 5$

Complementary Soln

Particular Soln

Char Eqn

$x^2 - 3x + 2 = 0$

Theorem:  $T_n = L(x)^n + m(x)^n$  Diff roots  
 or  $T_n = L(x)^n + m(x)^n$  Same roots

$T_n = an + b, an^2 + bn + c, a(x)^n + b$

$T_{n-1} = ?$   
 $T_{n-2} = ?$

\* Sub into eqn. given & solve for a, b (c)

Total Soln = Comp + Part