

Contents

1	Introduction	2
1.1	Difference Equations	2
1.2	Sequences	4
1.3	Behavior of Solutions of Difference Equations	5
1.4	Banach Spaces	7
1.5	Periodic Points and Cycles	9
1.6	Oscillating Sequences and Semicycles	10
1.7	Big o notation	10
1.8	Taylor Series and polynomials	11
2	On The Difference Equation $x_{n+1} = p_n + \frac{x_{n-1}}{x_n}$	13
2.1	Boundedness and persistence	14
2.2	Existence of unbounded solutions	19
2.3	Attractivity	25
2.4	Applications	31
3	On the Difference Equation $x_{n+1} = A_n + \frac{x_{n-1}^p}{x_n^q}$	35
3.1	Asymptotic behavior of the positive solutions	35
3.2	Periodicity and stability	49
4	On the Difference Equation $x_{n+1} = p_n + \frac{x_n}{x_{n-1}}$	65
4.1	Boundedness and persistence	65
4.2	Attractivity	69
4.3	Applications	91
	Bibliography	94