Math 3550 HOMEWORK #2 Name:

Due 9/11/2023, 11:30 a.m.

Solve the following problems and staple your solutions to this cover sheet. (Computer outputs must be put in the appropriate place in the solution, not attached as an appendix. You may physically cut and paste the output in the problem or allow appropriate space in the printout to add your hand written work.)

1. Sec 1.1, Prob 1(c).
2. Sec 1.1, Prob 2(d). Find a formula for a_n in terms of n, not a recurrence relation.
3. Sec 1.1, Prob 3(d). The first differences follow a geometric pattern.
4. Sec 1.1, Prob 4(d).
5. Sec 1.1, Prob 9 and Sec 1.3, Prob 7. For problem 7 in section 1.3, change the loan amount to \$200,000 to match problem 9 in section 1.1. Use a `RecurrenceTable` with different p values until $a_{360} = 0$.
6. Sec 1.2, Prob 2. See the Mathematica Notebook for Section 1.2 in my website.
7. Sec 1.2, Prob 3.

Mathematica Commands

The numerical values of a recurrence relation $a_{n+1} = f(a_n)$ with initial condition a_0 for $n = 0$ to $n = m$ can be obtained the following way.

`RecurrenceTable[{a[n+1]==`$f(a_n)$`, a[0]==`a_0`}, a, {n, 0, m}]`

To plot a simple recurrence relation $a_{n+1} = f(a_n)$ with initial condition a_0 for $n = 0$ to $n = m$ do the following.

```
a[0]=a0;
a[n_]:=f(an−1)
ListPlot[Table[{n, a[n]},{n, 0, m}]]
```

To plot anything but a very simple recurrence relation $a_{n+1} = f(a_n)$ with initial condition a_0 for $n = 0$ to $n = m$ do the following.

```
xvalues = Table[n, {n, 0, m}];
yvalues = RecurrenceTable[{a[n] == f(an−1), a[0] == a0}, a, {n, 0, m}]
points = Transpose[{xvalues, yvalues}]
ListPlot[points]
```

To plot a simple recurrence relation $a_{n+1} = f(a_n)$ with several initial condition values a_{01}, a_{02}, ..., a_{0k} for $n = 0$ to $n = m$ on the same coordinate system, do the following.

```
a[n_]:=f(an−1)
ListPlot[Table[Table[{n, a[n]},{n, 0, m}],{a[0],{a01, a02, ... , a0k}}]]
```