Math 350 Final

Name: _____

The written part of the exam should take about 30–45 minutes to complete. No computers are permitted for this part of the exam. When done with the written part, turn in your work and then use the remaining class time to complete the computer portion.

For the computer portion of the exam, you can use Mathematica and its documentation but not our previous lectures or sets or any internet resources. Turn in the computer portion to Canvas as usual.

1. Write down Mathematica code that will produce the following output (without simply recopying the expression as written, of course!):

a. `{2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53}`

b.  (This is a graphic of a square with side length 1.)

2. Using English sentences, describe what the following commands will do:

a. `f[L_List]:= L/(Plus@@L)`

b. `L /. x_ /; x < 0 -> 0`

c. `Plot3D[Evaluate[D[Sin[x^2 + y^2],x]],{x,-Pi,Pi},{y,-Pi,Pi}]`

3. What would result if these expressions are evaluated? (Act as Mathematica and run the code):

a. `Graph[UndirectedEdge[0, #] & /@ Range@5]`

b.
```
f[n_] := Which[n <= 0, 1, n <= 1, -1, True, f[n - 1]/f[n - 2]]
f /@ Range@6
```

c. `Det@{{1,1},{1,-1}}`

4. Write down Mathematica commands that will output the following:

a. The number of permutations of $1, 2, \ldots, 10$ such that i is never in position i for any i.

b. The Taylor series expansion for e^{-x^2} centered at $x = 0$ up to the x^9 term.