Name:

Graded by: Matthew McGowan

**TOTAL POINTS: /100**

Problem 1: Define a distribution that is a combination of any distributions covered in class. Name the distribution and write a function. (20 points)

* Define the function for a new distribution, uses combination, distribution is different (5 points) Full Points
* Parameters include n (5 points)

Full Points

* Code is well commented (I can follow) (5 points)

Full Points

* No bugs in code (5 points)

Full Points

Comments:

POINTS: 20

Problem 2: Sample ten thousand observations from the distribution you defined. Make scatter, histogram, density , and cumulative density plots

* Sampling (2 pts)

Full Points

* Scatter plot (2 pts)

Full Points

* Histogram plot (2 pts)

Full Points

* Density plot (2 pts)

Full Points

* Cumulative density plot (2 pts)

Full Points

* Commenting (5 pts)

Full Points

* No bugs (5 pts)

Full Points

Comments:

POINTS: 20

Problem 3: Create tables for your variable at different percentiles (1, 5, 10, 50, 90, 95, 99). Describe the impact of the parameters of your distribution.

* Table (5 pts)

Full Points

* Description (10 pts)
	+ Do they explore each parameter? (5 pts)

Full Points

* + Do they sensibly describe the impact? (5 pts)

Full Points

* Commenting and bugs (5 pts)

Full Points

Comments:

POINTS: 20

Problem 4: Generate one or multiple samples with sizes of your choices from the distribution you defined and define a statistic from your sample.

* Did they sample correctly? (5 pts)

Full Points

* Did they define a statistic and adequately explain it? (5 pts)

Full Points

* Commenting and bugs (10 pts)

Full Points

Comments:

POINTS: 20

Problem 5: Create 10k replicates of your statistics and make the same plots as in problem 2.

* Did they sample 10k iterations properly (5 pts)

Full Points

* Did they plot it well (5 pts)

Full Points

* Did they make of the statistic (5 pts)

Full Points

* Commenting and bugs (5 pts)

Full Points

Comments:

POINTS: 20

Problem 6 (Extra Credit): Create a real world narrative that makes sense out of your distribution.

* The student provides a real-world example that could explain the distribution (10 pts)
* The student explains the first-order derivative of relevant statistics (10 pts)