* 1. **Homework**

**1. Show that the probability distributions below has the form required by the exponential family. Determine the functions , , , and , from the general exponential distribution for each of the probability distributions below.**

* **Pareto distribution:**

* **Exponential distribution:**

**4. Replicate the charts for the Normal distribution shown in section**[**3.1**](https://www.franciscoazeredo.com/teaching/nonlinear/_book/expFamily.html#expFamilyNormal)**. Include all 6 charts for each distribution.**

**A graph of a function

Description automatically generated**

**5. Replicate the charts for the Binomial distribution shown in section**[**3.2**](https://www.franciscoazeredo.com/teaching/nonlinear/_book/expFamily.html#expFamilyBinomial)**. Include all charts for each distribution.**

**A graph of a function

Description automatically generated**

**6. Replicate the charts for the Poisson distribution shown in section**[**3.3**](https://www.franciscoazeredo.com/teaching/nonlinear/_book/expFamily.html#expFamilyPoisson)**. Include all 6 charts for each distribution.**

**A graph of a function

Description automatically generated**

* 1. **Homework**

**1. Based on the R dataset in the Lab folder (1030.lecture-mle.RData), reproduce the results presented above for the Binomial distribution. Plot results, maximum likelihood estimates and R code must be submitted.**

A graph of a graph

Description automatically generated with medium confidence

A comparison of graphs with numbers

Description automatically generated with medium confidence

**2. Based on the R dataset in the Lab folder (1030.lecture-mle.RData) reproduce the results presented above for the Poisson distribution. Plot results, maximum likelihood estimates and R code must be submitted.**

A graph of a red line and a red line

Description automatically generated with medium confidence

A graph of a normal distribution

Description automatically generated with medium confidence