

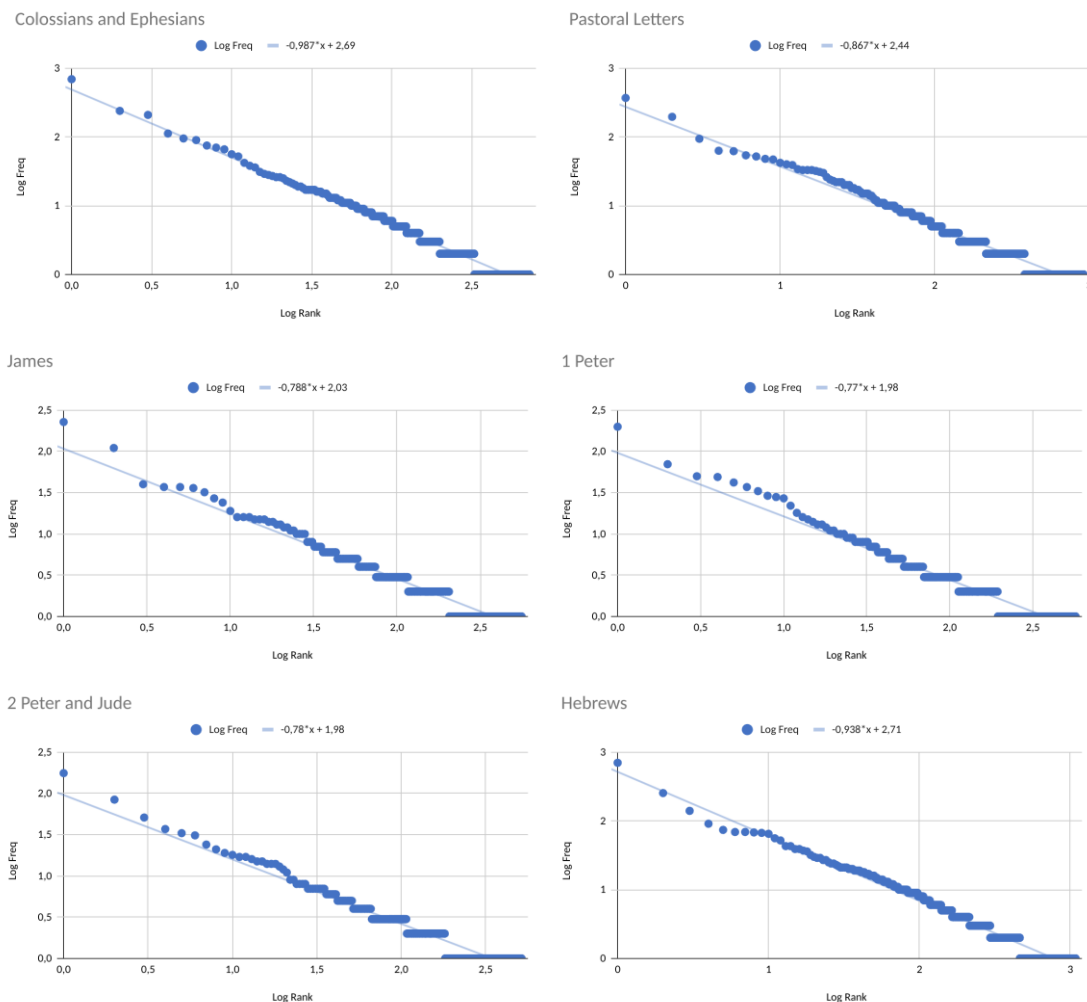
## Power law fitting using linear regression

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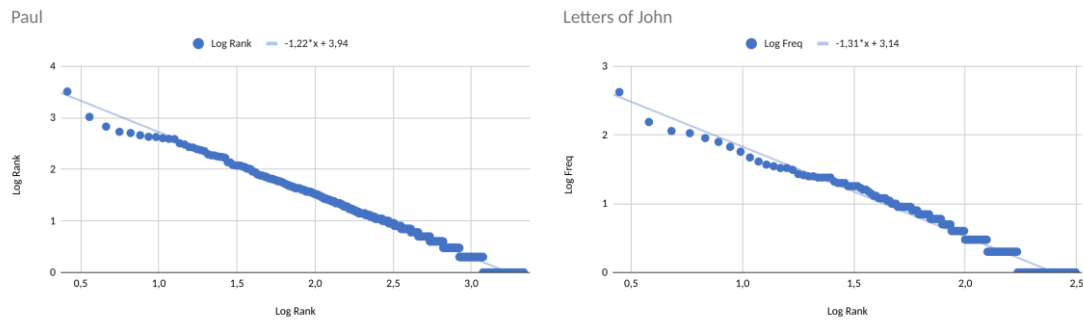
To determine the best-fitting power laws for each epistolary corpus, we must determine the exponent  $\alpha$  that determines the power function:

$$f = \frac{C}{x^\alpha}$$

For each epistolary corpus, we graph log ranks and their corresponding log frequencies on a log-log plot to determine how well our data demonstrates theoretical power law behavior as predicted by the regression line. For six epistolary corpora, Chi-Squared Goodness-of-Fit tests return  $p$ -values of 100%, which implies very high likelihood that their frequency distributions demonstrate power law behavior predicted by our regression models:



For Paul and the Letters of John, a non-zero shifting parameter was needed to minimize the Chi-Squared statistic, at which point we achieved for each corpus a  $p$ -value of 100%:



In summary, we find that the following parameters render the best-fitting power law models for each epistolary corpus:

Corpus	Shifting parameter	Scaling parameter
Paul	1.6	1.22
Colossians & Ephesians	0	0.99
Pastoral Letters	0	0.87
James	0	0.79
1 Peter	0	0.77
2 Peter & Jude	0	0.78
Letters of John	1.8	1.3
Hebrews	0	0.95