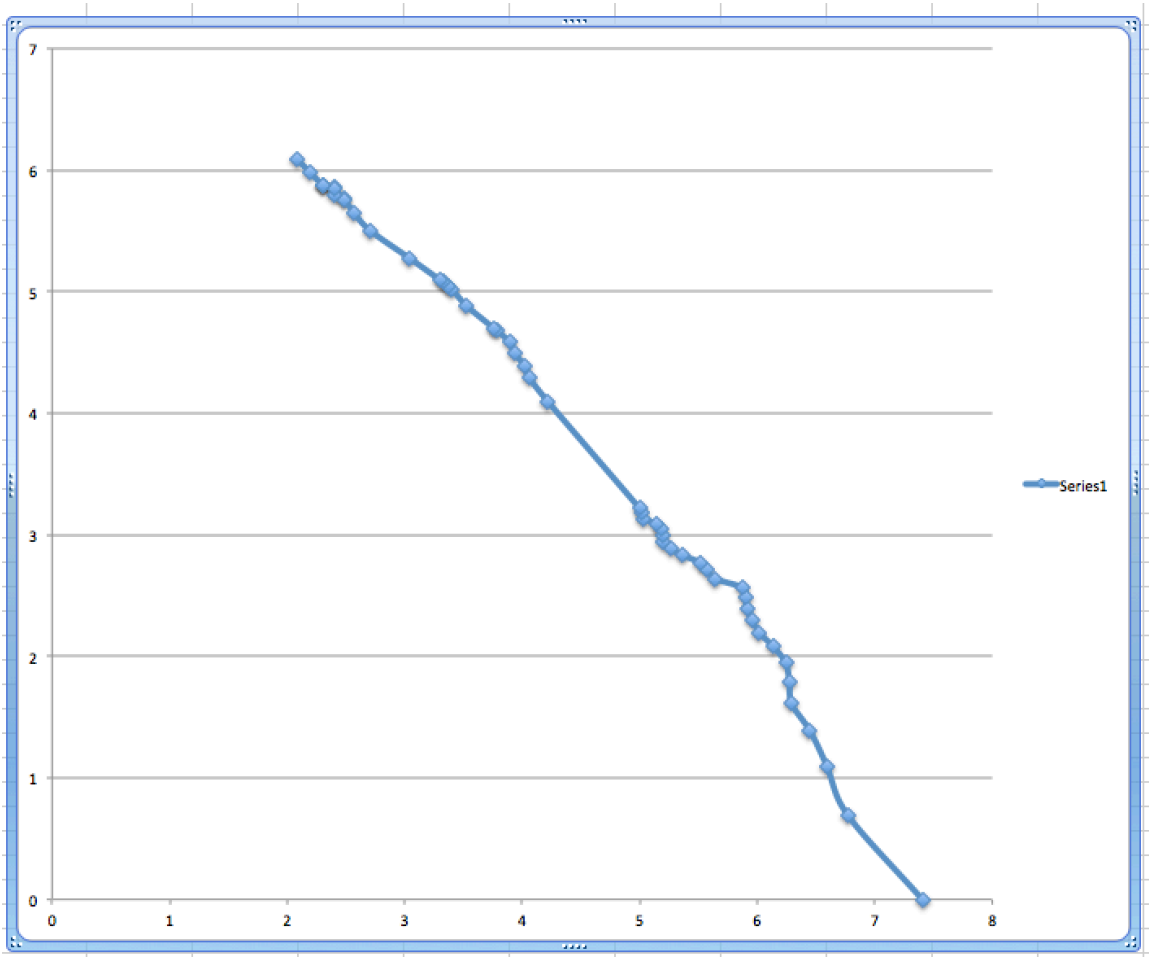
Answer 2 a:



X-axis: log (frequency)

Y-axis: log (rank)

According the Zipf's law the probability of finding a r^{th} word in the English language is given by :

$$P(r) = 0.1/r$$

$$\Rightarrow \quad P(r) * r = 0.1$$

Word : the

Frequency : 1644

Rank : 1

Probability : 0.0615891806841

Word : and

Frequency : 872

Rank : 2

Probability : 0.0326677406062

Product : 0.0653354812123

Word : to

Frequency : 729

Rank : 3

Probability : 0.0273105308508

Product : 0.0819315925524

Word : a

Frequency : 632

Rank : 4

Probability : 0.0236766193384

Product : 0.0947064773536

Word : minutes

Frequency : 11

Rank : 349

Probability : 0.000412093058105

Word : mind

Frequency : 11

Rank : 327

Probability : 0.000412093058105

Product : 0.13475443

Word : makes

Frequency : 11

Rank : 345

Probability : 0.000412093058105

Product : 0.142172105046

Word : mine

Frequency : 10

Rank : 356

Probability : 0.000374630052823

Product : 0.133368298805

Word : mouth

Frequency : 10

Probability : 0.000374630052823

Product : 0.133742928858

Word : mean

Frequency : 10

Rank : 355

Probability : 0.000374630052823

Product : 0.132993668752

Word : matter

Frequency : 9

Rank : 395

Probability : 0.000337167047541

Product : 0.133180983779

Word : making

Frequency : 8

Rank : 443

Probability : 0.000299704042258

Product : 0.13276889072

- If one can observe that the product value for all the words is approximately coming equal to 0.1 for all ranks and especially for higher ranks, which states that the code follows the Zipf's law. Also there is the graph which has been plotted via log(frequency) and log(rank), it is a linear graph which is usually plotted for values following Zipf's law.