Problem 1:

a)

b)

c)

d)

e)

f)

Table 1: Space loss over various distances

|  |  |  |  |
| --- | --- | --- | --- |
| R (AU) | Space Loss | Space Loss (dB) | Power input (W) |
| 1 | 2.16E-29 | -286.65 | 7.91 |
| 2 | 5.40E-30 | -292.67 | 31.65 |
| 3 | 2.40E-30 | -296.19 | 71.21 |
| 4 | 1.35E-30 | -298.69 | 126.59 |
| 5 | 8.64E-31 | -300.63 | 197.80 |
| 6 | 6.00E-31 | -302.21 | 284.83 |
| 7 | 4.41E-31 | -303.55 | 387.69 |
| 8 | 3.37E-31 | -304.71 | 506.37 |
| 9 | 2.66E-31 | -305.73 | 640.88 |
| 10 | 2.16E-31 | -306.65 | 791.21 |

Figure 1: Graph of table 1, distance from earth versus power required to communicate

g)

Percent confidence for Eb/No = 15 dB: 43.1%

Percent confidence for Eb/No = 7 dB: 99.9%

I was able to get these by adding up all of the values that were in the Eb/No linear values in the ProbWorks\_Run output document and divided by the total number of samples. The percent confidence means the chance that the values in the sample set are above either the equivalent of 7 or 15 dB Eb/No value. How confident we are that the values under several different conditions will be within the specified cut-off, could be another way to think of it.

Table 2: Cumultive Density Function graph using the Eb/No function.

Table 3: Probability Density Function graph of the Eb/No function.