31st July

1. 100 dice were thrown into a container. Those that landed with a 1 or a 2 showing were removed, and the remaining dice thrown again and so on.

   The following data was recorded:

Number of throws (n)	Number of dice remaining (D)	ln D
0	100	4.61
1	64	4.16
2	46	3.83
3	29	3.37
4	19	
5	14	
6	8	
7	5	
8	4	
9	3	
10	2	

   It has been suggested that: $D = D_0 e^{-kn}$

   D is the number of dice, D_0 was the original number of dice, n is the number of throws and k is a constant.

   a. Complete the table with values of ***ln D***

   b. Take the **natural log** of both sides of the equation $D = D_0 e^{-kn}$

   c. Plot a **graph** of *ln D* against *n*

   d. Calculate the **gradient** of the line

   e. Use the value for your gradient to determine a value for ***k***

   f. Calculate ***ln*2 / *k*** and **compare** this to the value of half-life you calculated yesterday

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