 Another way to determine k

Simple growth or decay model

N(t)=Aekt

Rearranging this equation we get:

ln[N(t)⁄A]=kt

If we produce a scatterplot of ln[N(t)/A] verse t, the gradient of the line of best fit (with a y-intercept of zero) is approximately k.

Example: Exponential growth Using Dice. This activity started with an initial population of 1 (A = 1).

| Time | Population | ln[N(t)/A] |
| --- | --- | --- |
| 0 | 1 | 0 |
| 1 | 1 | 0 |
| 2 | 2 | 0.693147 |
| 3 | 3 | 1.098612 |
| 4 | 5 | 1.609438 |
| 5 | 8 | 2.079442 |
| 6 | 12 | 2.484907 |
| 7 | 17 | 2.833213 |
| 8 | 24 | 3.178054 |

Scatterplot of ln[N(t)/A] verse t

From this graph the gradient is 0.398, k = 0.398

Taking a scatterplot of the population verse time and adding the graph of N(t)=1e0.398t we get:

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