The Mathematics of *Ion Saliu's Paradox*

$$1 - \frac{1}{e} = .632120558828558...$$

By Ion Saliu

We start with one of the steps leading to the ***Fundamental Formula of Gambling (FFG)***:

$$1 - DC = (1 - p)^N$$

DC represents the *degree of certainty*, **p** represents the *probability*, and **N** represents the *number of trials*.

We can express the probability as $\mathbf{p} = \frac{1}{N}$; e.g. the probability of getting one point face when rolling a die is *1 in 6* or $\mathbf{p} = \frac{1}{6}$

It is common sense that if we repeat the event N times we expect one success. That might be true for an extraordinarily large number of trials. If we repeat the event N times, we are NOT guaranteed to win. If we play roulette 38 consecutive spins, the chance to win is significantly less than 1!

$$1 - DC = (1 - \frac{1}{N})^N$$

I noticed that $(1 - \frac{1}{N})^N$ has a limit: $\frac{1}{e}$, (**e** is the base of the *natural logarithm (ln)*.

$$1 - DC = \frac{1}{e}$$

Thusly:

$$DC = \lim (1 - \frac{1}{e}) = .632120558828558...$$

Soon after I published my *glorious* page on theory of probability (in 2004), the adverse reactions were instantaneous. I even received multiple hostile emails from the same individual! Basically, they considered my $\frac{1}{e}$ discovery as idiocy! *"You are mathematically challenged"*, they were cursing! Guess, what? I saw in 2012 an edited page of *Wikipedia* (***e** constant*) where my $\frac{1}{e}$ discovery is considered correct mathematics. Of course, they do not give me credit for that. Nor do they demonstrate mathematically the $\frac{1}{e}$ relation — because they don't know the demonstration (as of March 21, 2012)!

You see the mathematical proof right here, for the first time.

$$e = (1 + \frac{1}{N})^N$$

Let's demonstrate that:

$$(1 - \frac{1}{N})^N = \frac{1}{e} = \frac{1}{(1 + \frac{1}{N})^N}$$

If 2 relations are equal, then their *Nth roots* are also equal:

$$(1 - \frac{1}{N}) = \frac{1}{(1 + \frac{1}{N})}$$

$$\lim(1 - \frac{1}{N} + \frac{1}{N} - \frac{1}{N^2}) = \lim(1 - \frac{1}{N^2}) = 1$$

when **N** tends to Infinity. Therefore:

$$(1 - \frac{1}{N})^N = \frac{1}{e}$$

QED.

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