My Coding Solution to the “Birthday Paradox”

Birthday paradox ---
IF THERE ARE 23 PEOPLE IN A ROOM, THE CHANCES OF 2 OF THEM HAVING THE SAME BIRTHDAY IS GREATER THAN 50%
now some of the sites which I have referred have solved with a perspective that “THE CHANCES OF AT LEAST 2 OF THEM HAVING THE SAME BIRTHDAY”.

Here, I’ll try to solve for both of the scenarios.

If there are 23 people in a room, the chances of 2 of them having the same birthday is greater than 50%

p(B) = probability of 2 people sharing the same birthday = 1/365 = 0.0027

```
In[•]:= N[1 / 367, 10]
Out[•]= 0.002724795640
```

p` (B) = probability of 2 people not sharing the same birthday = 1 - p(B) = 1 - 0.0027 = 0.9973

```
In[•]:= 1 - %4
Out[•]= 0.997275204360

In[•]:= ClearAll["Global`*"]
```

In[•]:= $\texttt{SameDay[n\_, k\_] := 1} - \dfrac{\texttt{P[n, k]}}{\texttt{k}^{\texttt{n}}}$

$\texttt{P[n\_, k\_] := N}\left[\dfrac{\texttt{Factorial[k]}}{\texttt{Factorial[k - n]}}, \texttt{10}\right]$

```
In[•]:= SameDay[23, 365]
Out[•]= 0.5072972343
```

If there are 23 people in a room, the chances of at least 2

of them having the same birthday is greater than 50%

p(B) = probability of 2 people sharing the same birthday = 1/365 = 0.0027

In[ ]:=
```
N[1 / 367, 10]
```
Out[ ]=
```
0.002724795640
```

p`(B) = probability of 2 people not sharing the same birthday = 1 - p(B) = 1 - 0.0027 = 0.9973

In[ ]:=
```
1 - %4
```
Out[ ]=
```
0.997275204360
```

In[ ]:=
```
SameBday[x_, t_] := 1 - N[((t - 1)/t)^Comb[x,t], 10]
```
$$\text{SameBday}[x\_, t\_] := 1 - N\left[\left(\frac{t-1}{t}\right)^{\text{Comb}[x,t]}, 10\right]$$

$$\text{Comb}[x\_, t\_] := \frac{\text{Factorial}[x]}{\text{Factorial}[x-2] * 2}$$

In[ ]:=
```
SameBday[23, 365]
```
Out[ ]=
```
0.5004771540
```