How can the Uniform Distribution be used in Excel?

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The Uniform Distribution is a probability distribution that can be utilized in Excel to generate random numbers with equal likelihood. This distribution is useful in a variety of statistical applications, such as simulation and modeling, as it allows for the creation of a uniform spread of values between a specified minimum and maximum. In Excel, the Uniform Distribution can be accessed through the RAND() function, which generates a random number between 0 and 1, and can be further manipulated to fit specific ranges. This tool in Excel is particularly helpful for creating a large sample size for statistical analysis or generating random inputs for simulations. Overall, the Uniform Distribution in Excel provides a simple and efficient way to incorporate randomness and variability into data analysis.

Use the Uniform Distribution in Excel

A is a probability distribution in which every value between an interval from *a* to *b* is equally likely to be chosen.

The probability that we will obtain a value between x1 and x2 on an interval from *a* to *b* can be found using the formula:

P(obtain value between x1 and x2) = (x2 - x1) / (b - a)

The uniform distribution has the following properties:

The mean of the distribution is $\mu = (a + b) / 2$
The variance of the distribution is $\sigma 2 = (b - a)2 / 12$
The standard deviation of the distribution is $\sigma = \sqrt{\sigma 2}$

The following examples show how to calculate probabilities for uniform distributions in Excel.

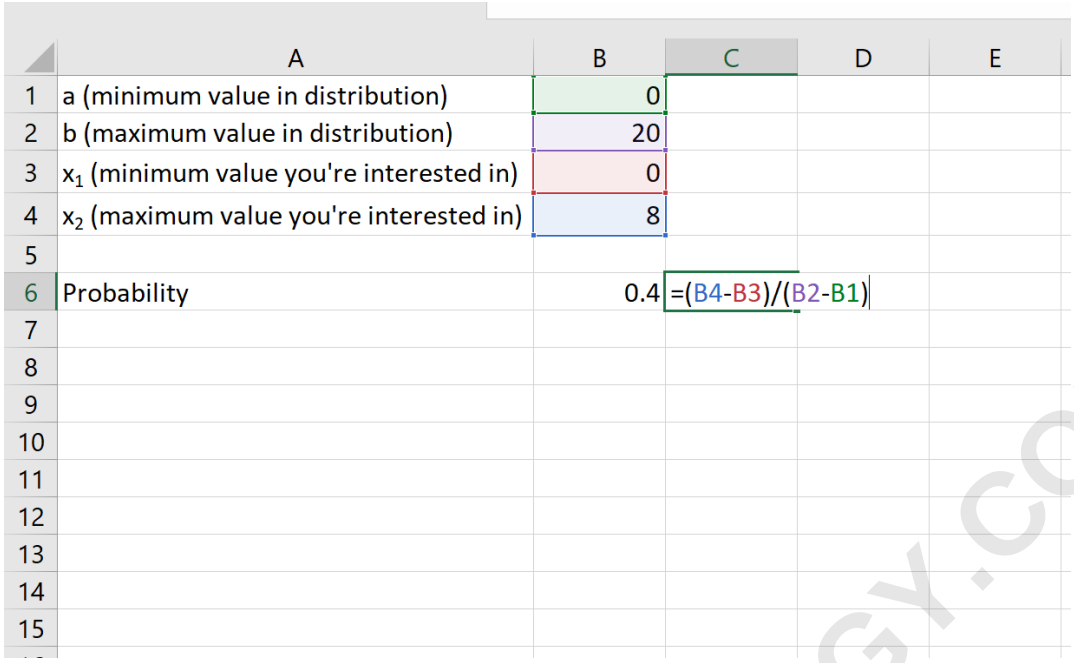
Note: You can double check the solution to each example below using the .

Examples: Uniform Distribution in Excel

Example 1: A bus shows up at a bus stop every 20 minutes. If you arrive at the bus stop, what is the probability that the bus will show up in 8 minutes or less?

Solution:

a: 0 minutes
b: 20 minutes
x1: 0 minutes
x2: 8 minutes



	A	B	C	D	E
1	a (minimum value in distribution)	0			
2	b (maximum value in distribution)	20			
3	x_1 (minimum value you're interested in)	0			
4	x_2 (maximum value you're interested in)	8			
5					
6	Probability	0.4	=(B4-B3)/(B2-B1)		
7					
8					
9					
10					
11					
12					
13					
14					
15					

The probability that the bus shows up in 8 minutes or less is 0.4.

Example 2:The weight of a certain species of frog is uniformly distributed between 15 and 25 grams. If you randomly select a frog, what is the probability that the frog weighs between 17 and 19 grams?

Solution:

a: 15 grams

b: 25 grams

x1: 17 grams

x2: 19 grams

The probability that the frog weighs between 17 and 19 grams is 0.2.

Example 3: ***The length of an NBA game is uniformly distributed between 120 and 170 minutes. What is the probability that a randomly selected NBA game lasts more than 150 minutes?***

Solution:

a: 120 minutes

b: 170 minutes

x1: 150 minutes

x2: 170 minutes

	A	B	C	D	E
1	a (minimum value in distribution)	120			
2	b (maximum value in distribution)	170			
3	x_1 (minimum value you're interested in)	150			
4	x_2 (maximum value you're interested in)	170			
5					
6	Probability	0.4	=(B4-B3)/(B2-B1)		
7					
8					
9					
10					
11					
12					
13					
14					
15					

The probability that a randomly selected NBA game lasts more than 150 minutes is 0.4.

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