# Distribution Assignment Answers

## Question 1:- Simulate 30 rolls with =RANDBETWEEN(1,6). What is the probability of rolling a 3 exactly 5 times? (Hint: Use BINOM.DIST)

**Solution:-**

**Given**

* Number of trials: (30 dice rolls)
* Probability of getting a 3 on one roll:
* Number of successes (rolling a 3):

**Required**

Probability of rolling a **3 exactly 5 times**.

**Binomial Formula**

=BINOM.DIST(5,30,1/6,FALSE)  
**RESULT**  P(X=5)≈0.1921

## Question 2:- Generate 100 values in Excel using the continuous uniform distribution RAND() and plot a histogram. Describe the shape of the distribution.

**Solution:-**

Generate 100 values with =RAND(). Plot histogram.

Shape: Uniform distribution, approximately flat.

## Question 3:- A dataset has a mean of 50 and a standard deviation of 5. What percentage of values lie between 45 and 55 if the data follows a normal distribution?

**Solution:-** Mean=50, SD=5. Values between 45 and 55.

**For :**

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Formula: =NORM.DIST(55,50,5,TRUE)-NORM.DIST(45,50,5,TRUE)

**RESULT**  ~68.27% (Empirical Rule).

## Question 4:- What is the concept of standardization (z-score), and why is it important in data analysis? Explain the formula and how standardization transforms a dataset.

**Solution:-** Standardization (z-score):

Formula: z = (x - μ)/σ

Importance: Allows comparison across datasets, transforms to mean 0, SD 1.

## Question 5:- What is Kurtosis and their type?

Kurtosis: Measure of tailedness.

**Solution:-** Types:

- Mesokurtic (normal, kurtosis ~3)

- Leptokurtic (heavy tails, kurtosis >3)

- Platykurtic (light tails, kurtosis <3)

## Question 6:- Explain why the uniform distribution is a good model for the outcome of rolling a fair die.

**Solution:-** Uniform distribution for fair die: Each outcome equally likely (1/6).

Good model because probabilities are constant.

## Question 7:- Use Excel to compute the probability of getting at least 8 successes in 15 trials with success probability 0.5

**Solution:-** Probability of at least 8 successes in 15 trials, p=0.5.

Formula: =1-BINOM.DIST(7,15,0.5,TRUE)

Explanation: Complement of cumulative probability up to 7.

## Question 8:- How does log transformation help in stabilizing variance and making data more normally distributed?

**Solution:-** Log transformation: Stabilizes variance, reduces skewness, makes data closer to normal distribution.

Formula: y' = LOG(y).