Senior High School

Statistics and Probability

Quarter 3 – Module 1: Random Variables and Probability Distributions

ALTERNATIVE DELIVERY MODE

ADM

Statistics and Probability
Alternative Delivery Mode
Quarter 3 – Module 1: Random Variables and Probability Distributions
First Edition, 2020

Published by the Department of Education
Secretary: Leonor Magtolis Briones
Undersecretary: Diosdado M. San Antonio

SENIOR HS MODULE DEVELOPMENT TEAM

AUTHOR : Chelsea Mae B. Brofar
Co-Author – Language Editor : Mee Ann Mae Loria - Tungol
Co-Author – Content Evaluator : Haren B. Valencia
Co-Author – Illustrator : Chelsea Mae B. Brofar
Co-Author – Layout Artist : Chelsea Mae B. Brofar

TEAM LEADERS
School Head : Reycor E. Sacdalan, PhD
LRMDS Coordinator : Pearly V. Villagracia

SDO-BATAAN MANAGEMENT TEAM
Schools Division Superintendent : Romeo M. Alip, PhD, CESO V
OIC- Asst. Schools Division Superintendent : William Roderick R. Fallorin, CESE
Chief Education Supervisor, CID : Milagros M. Peñaflor, PhD
Education Program Supervisor, LRMDS : Edgar E. Garcia, MITE
Education Program Supervisor, AP/ADM : Romeo M. Layug
Education Program Supervisor, Senior HS : Danilo C. Caysido
Project Development Officer II, LRMDS : Joan T. Briz
Division Librarian II, LRMDS : Rosita P. Serrano

REGIONAL OFFICE 3 MANAGEMENT TEAM
Regional Director : May B. Eclar, PhD, CESO III
Chief Education Supervisor, CLMD : Librada M. Rubio, PhD
Education Program Supervisor, LRMS : Ma. Editha R. Caparas, EdD
Education Program Supervisor, ADM : Nestor P. Nuesca, EdD

Senior High School

Statistics and Probability

Quarter 3 – Module 1: Random Variables and Probability Distributions

DepED
DEPARTMENT OF EDUCATION

Introductory Message

This Self-Learning Module (SLM) is prepared so that you, our dear learners, can continue your studies and learn while at home. Activities, questions, directions, exercises, and discussions are carefully stated for you to understand each lesson.

Each SLM is composed of different parts. Each part shall guide you step-by-step as you discover and understand the lesson prepared for you.

Pre-tests are provided to measure your prior knowledge on lessons in each SLM. This will tell you if you need to proceed on completing this module or if you need to ask your facilitator or your teacher's assistance for better understanding of the lesson. At the end of each module, you need to answer the post-test to self-check your learning. Answer keys are provided for each activity and test. We trust that you will be honest in using these.

In addition to the material in the main text, Notes to the Teacher are also provided to our facilitators and parents for strategies and reminders on how they can best help you on your home-based learning.

Please use this module with care. Do not put unnecessary marks on any part of this SLM. Use a separate sheet of paper in answering the exercises and tests. And read the instructions carefully before performing each task.

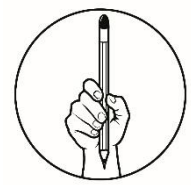
If you have any questions in using this SLM or any difficulty in answering the tasks in this module, do not hesitate to consult your teacher or facilitator.

Thank you.

What I Need to Know

After going through this module, you are expected to:

1. Illustrate a random variable (discrete or continuous). **M11/12SP-IIIa-1**
2. Distinguish between a discrete and continuous random variable. **M11/12SP-IIIa-2**
3. Find possible values of a random variable. **M11/12SP-IIIa-3**
4. Illustrate a probability distribution for a discrete random variable and its properties. **M11/12SP-IIIa-4**
5. Compute probabilities corresponding to a given random variable. **M11/12SP-IIIa-6**



What I Know

DIRECTION: Write your answer on a separate sheet of paper.

A. Read the statements carefully and choose the letter of the best answer.

1. If two coins are tossed once, which is NOT a possible value of the random variable for the number of heads?
   A. 0
   B. 1
   C. 2
   D. 3

2. Which of the following is a discrete random variable?
   A. Length of wire ropes
   B. Number of soldiers in the troop
   C. Amount of paint used in repainting the building
   D. Voltage of car batteries

3. Which formula gives the probability distribution shown by the table?

X	3	4	5
P(X)	1/3	1/4	1/5

   A. P(X) = X
   B. P(X) = 1/X
   C. P(X) = X/3
   D. P(X) = X/5

4. How many ways are there in tossing two coins once?
   A. 4
   B. 3
   C. 2
   D. 1

5. It is a numerical quantity that is assigned to the outcome of an experiment.
   A. random variable
   B. variable
   C. probability
   D. probability distribution

B. Classify the following random variables as *discrete* or *continuous*.

1. The weight of the professional wrestlers
2. The number of winners in lotto for each day
3. The area of lots in an exclusive subdivision
4. The speed of a car
5. The number of dropouts in a school per district

C. Determine the values of the random variables in each of the following distributions.

1. Two coins are tossed. Let T be the number of tails that occur. Determine the values of the random variable T.

2. A meeting of envoys was attended by 4 Koreans and 2 Filipinos. If three envoys were selected at random one after the other, determine the values of the random variable F representing the number of Filipinos.

Lesson 1 Random Variables and Probability Distribution

You have learned in your past lessons in junior high school Mathematics that an experiment or trial is any procedure or activity that can be done repeatedly under similar conditions. The set of all possible outcomes in an experiment is called the sample space. The concept of probability distribution is very important in analyzing statistical data especially in hypothesis testing.

In this lesson, you will explore and understand the random variable.

Before we discuss probability distribution, it is necessary to study first the concept of random variable. Try to do the next activity to prepare you for this lesson. Stay focused.

What's In

A. Identify the term being described in each of the following:

1. Any activity which can be done repeatedly under similar conditions
2. The set of all possible outcomes in an experiment
3. A subset of a sample space
4. The elements in a sample space
5. The ratio of the number of favorable outcomes to the number of possible outcomes

B. Answer the following questions.

1. In how many ways can two coins fall?
2. If three coins are tossed, in how many ways can they fall?
3. In how many ways can a die fall?
4. In how many ways can two dice fall?
5. How many ways are there in tossing one coin and rolling a die?

Notes to the Teacher

This part aims to assess if the students have prior knowledge about the topic. Also, it prepares the students to absorb the lesson.

What's New

Mary Ann, Hazel, and Analyn want to know what numbers can be assigned for the frequency of heads that will occur in tossing three coins. Can you help them? Thanks!

The answer in this question requires an understanding of random variables. You can do it! Aja!

Definitions of Random Variable

- A random variable is a result of chance event, that you can measure or count.
- A random variable is a numerical quantity that is assigned to the outcome of an experiment. It is a variable that assumes numerical values associated with the events of an experiment.
- A random variable is a quantitative variable which values depends on change.

NOTE:

We use capital letters to represent a random variable.

Example 1

Suppose two coins are tossed and we are interested to determine the number of tails that will come out. Let us use T to represent the number of tails that will come out. Determine the values of the random variable T.

Solution:

<table>
<tr><th>Steps</th><th>Solution</th></tr>
<tr><td>1. List the sample space</td><td>S = {HH, HT, TH, TT}</td></tr>
<tr><td>2. Count the number of tails in each outcome and assign this number to this outcome.</td><td>
<table>
<tr><th>Outcome</th><th>Number of Tails (Value of T)</th></tr>
<tr><td>HH</td><td>0</td></tr>
<tr><td>HT</td><td>1</td></tr>
<tr><td>TH</td><td>1</td></tr>
<tr><td>TT</td><td>2</td></tr>
</table>
</td></tr>
<tr><td>3. Conclusion</td><td>The values of the random variable T (number of tails) in this experiment are 0, 1 and 2.</td></tr>
</table>

Example 2

Two balls are drawn in succession without replacement from an urn containing 5 orange balls and 6 violet balls. Let V be the random variable representing the number of violet balls. Find the values of the random variable V.

Solution:

Steps	Solution
1. List the sample space	S = {OO, OV, VO, VV}

<table>
<tr><td>2. Count the number of violet balls in each outcome and assign this number to this outcome.</td><td><table>
<tr><th>Outcome</th><th>Number of Violet balls
(Value of V)</th></tr>
<tr><td>OO</td><td>0</td></tr>
<tr><td>OV</td><td>1</td></tr>
<tr><td>VO</td><td>1</td></tr>
<tr><td>VV</td><td>2</td></tr>
</table></td></tr>
<tr><td>3. Conclusion</td><td>The values of the random variable V (number of violet balls) in this experiment are 0, 1, and 2.</td></tr>
</table>

Example 3

A basket contains 10 red balls and 4 white balls. If three balls are taken from the basket one after the other, determine the possible values of the random variable R representing the number of red balls.

Solution:

<table>
<tr><th>Steps</th><th>Solution</th></tr>
<tr><td>1. List the sample space</td><td>S = {RRR, RRW, RWR, WRR, WWR, WRW, RWW, WWW}</td></tr>
<tr><td>2. Count the number of red balls in each outcome and assign this number to this outcome.</td><td><table>
<tr><th>Outcome</th><th>Number of Red balls
(Value of R)</th></tr>
<tr><td>RRR</td><td>3</td></tr>
<tr><td>RRW</td><td>2</td></tr>
<tr><td>RWR</td><td>2</td></tr>
<tr><td>WRR</td><td>2</td></tr>
<tr><td>WWR</td><td>1</td></tr>
<tr><td>WRW</td><td>1</td></tr>
<tr><td>RWW</td><td>1</td></tr>
<tr><td>WWW</td><td>0</td></tr>
</table></td></tr>
<tr><td>3. Conclusion</td><td>The values of the random variable R (number of red balls) in this experiment are 0, 1, 2, and 3.</td></tr>
</table>

Example 4

Four coins are tossed. Let T be the random variable representing the number of tails that occur. Find the values of the random variable T.

Solution:

<table>
<tr><th>Steps</th><th>Solution</th></tr>
<tr><td>1. List the sample space</td><td>S = {HHHH, HHHT, HHTH, HHTT, HTHH, HTHT, HTTH, HTTT, THHH, THHT, THTH, THTT, TTHH, TTHT, TTTH, TTTT}</td></tr>
<tr><td>2. Count the number of tails in each outcome and assign this number to this outcome.</td><td>
<table>
<tr><th>Outcome</th><th>Number of tails (Value of T)</th></tr>
<tr><td>HHHH</td><td>0</td></tr>
<tr><td>HHHT</td><td>1</td></tr>
<tr><td>HHTH</td><td>1</td></tr>
<tr><td>HHTT</td><td>2</td></tr>
<tr><td>HTHH</td><td>1</td></tr>
<tr><td>HTHT</td><td>2</td></tr>
<tr><td>HTTH</td><td>2</td></tr>
<tr><td>HTTT</td><td>3</td></tr>
<tr><td>THHH</td><td>1</td></tr>
<tr><td>THHT</td><td>2</td></tr>
<tr><td>THTH</td><td>2</td></tr>
<tr><td>THTT</td><td>3</td></tr>
<tr><td>TTHH</td><td>2</td></tr>
<tr><td>TTHT</td><td>3</td></tr>
<tr><td>TTTH</td><td>3</td></tr>
<tr><td>TTTT</td><td>4</td></tr>
</table>
</td></tr>
<tr><td>3. Conclusion</td><td>The values of the random variable T (number of tails) in this experiment are 0, 1, 2, 3, and 4.</td></tr>
</table>

Example 5

A pair of dice is rolled. Let X be the random variable representing the sum of the number of dots on the top faces. Find the values of the random variable X.

Solution:

<table>
<tr><th>Steps</th><th>Solution</th></tr>
<tr><td>1. List the sample space</td><td>S =
{(1, 1), (1, 2), (1, 3), (1, 4), (1, 5), (1, 6),
(2, 1), (2, 2), (2, 3), (2, 4), (2, 5), (2, 6),
(3, 1), (3, 2), (3, 3), (3, 4), (3, 5), (3, 6),
(4, 1), (4, 2), (4, 3), (4, 4), (4, 5), (4, 6),
(5, 1), (5, 2), (5, 3), (5, 4), (5, 5), (5, 6),
(6, 1), (6, 2), (6, 3), (6, 4), (6, 5), (6, 6)}</td></tr>
<tr><td>2. Count the sum of the number of dots in each outcome and assign this number to this outcome.</td><td>
<table>
<tr><th>Outcome</th><th>Sum of the number of dots
(Value of X)</th></tr>
<tr><td>(1, 1)</td><td>2</td></tr>
<tr><td>(1, 2), (2, 1)</td><td>3</td></tr>
<tr><td>(1, 3), (3, 1), (2, 2)</td><td>4</td></tr>
<tr><td>(1, 4), (4, 1), (2, 3), (3, 2)</td><td>5</td></tr>
<tr><td>(1, 5), (5, 1), (2, 4), (4, 2), (3, 3)</td><td>6</td></tr>
<tr><td>(1, 6), (6, 1), (2, 5), (5, 2), (4, 3), (3, 4)</td><td>7</td></tr>
<tr><td>(3, 5), (5, 3), (2, 6), (6, 2), (4, 4)</td><td>8</td></tr>
<tr><td>(5, 4), (4, 5), (6, 3), (3, 6)</td><td>9</td></tr>
<tr><td>(6, 4), (4, 6), (5, 5)</td><td>10</td></tr>
<tr><td>(5, 6), (6, 5)</td><td>11</td></tr>
<tr><td>(6, 6)</td><td>12</td></tr>
</table>
</td></tr>
</table>

3. Conclusion	The values of the random variable X (sum of the number of dots) in this experiment are 2, 4, 5, 6, 7, 8, 9, 10, 11, and 12.

Discrete and Continuous Random Variable

A random variable may be classified as *discrete* and *continuous*. A *discrete random variable* has a countable number of possible values. A *continuous random variable* can assume an infinite number of values in one or more intervals.

Examples:

Discrete Random Variable	Continuous Random Variable
Number of pens in a box	Amount of antibiotics in the vial
Number of ants in a colony	Length of electric wires
Number of ripe bananas in a basket	Voltage of car batteries
Number of COVID 19 positive cases in Hermosa, Bataan	Weight of newborn in the hospital
Number of defective batteries	Amount of sugar in a cup of coffee

What is It

In the previous grade levels in studying Mathematics, we have learned how to make a frequency distribution table given a set of raw data. In this part, you will learn how to construct a probability distribution.

In the previous part of this module, you already learned how to determine the values of discrete random variable. Constructing a probability distribution is just a continuation of the previous part. We just need to include an additional step to illustrate and compute the probabilities corresponding to a given random variable.

Using Example 1 in the previous page,

Steps	Solution
1. List the sample space	S = {HH, HT, TH, TT}

2. Count the number of tails in each outcome and assign this number to this outcome.

Outcome	Number of Tails (Value of T)
HH	0
HT	1
TH	1
TT	2

The values of the random variable T (number of tails) in this experiment are 0, 1, and 2.

3. Construct the frequency distribution of the values of the random variable T.

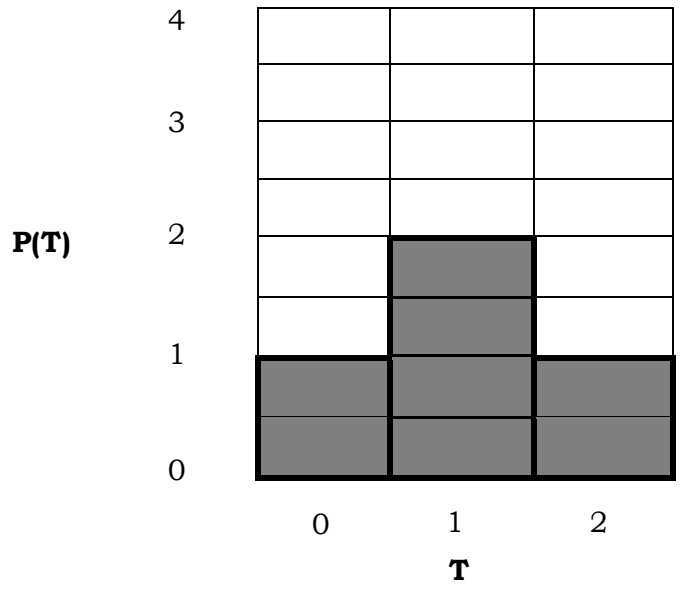
Number of Tails (Value of T)	Number of Occurrence (Frequency)
0	1
1	2
2	1
Total	4

4. Construct the probability distribution of the random variable T by getting the probability of occurrence of each value of the random variable.

Number of Tails (Value of T)	Number of Occurrence (Frequency)	Probability P(T)
0	1	1/4
1	2	2/4 or 1/2
2	1	1/4
Total	4	1

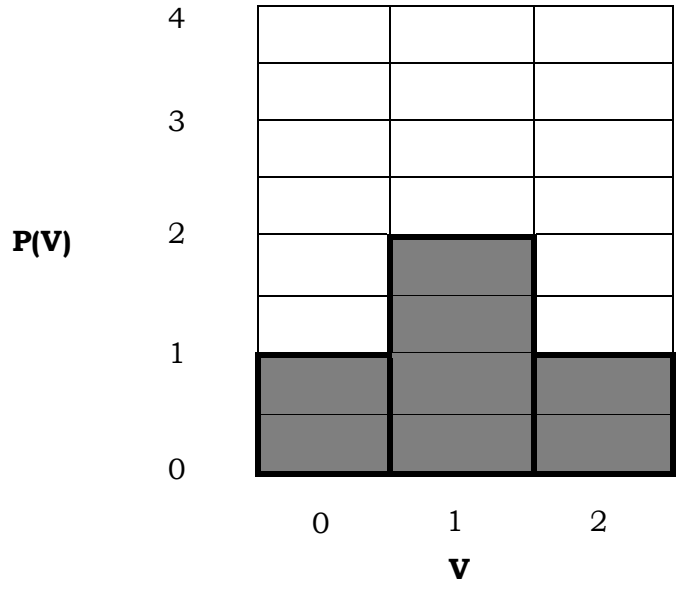
The probability distribution of the random variable T can be written as follows:

T	2	1	0
P(T)	1/4	1/2	1/4

5. Construct the probability histogram.	

Using Example 2 in the previous page,

Steps	Solution
1. List the sample space	S = {OO, OV, VO, VV}
2. Count the number of violet balls in each outcome and assign this number to this outcome.	<table><tr><th>Outcome</th><th>Number of Violet Balls (Value of V)</th></tr><tr><td>OO</td><td>0</td></tr><tr><td>OV</td><td>1</td></tr><tr><td>VO</td><td>1</td></tr><tr><td>VV</td><td>2</td></tr></table> The values of the random variable V (number of violet balls) in this experiment are 0, 1, and 2.
3. Construct the frequency distribution of the values of the random variable V.	<table><tr><th>Number of Violet Balls (Value of V)</th><th>Number of Occurrence (Frequency)</th></tr><tr><td>0</td><td>1</td></tr><tr><td>1</td><td>2</td></tr><tr><td>2</td><td>1</td></tr></table>

	Total | 4
4. Construct the probability distribution of the random variable V by getting the probability of occurrence of each value of the random variable.	<table><tr><th>Number of Violet balls (Value of V)</th><th>Number of Occurrence (Frequency)</th><th>Probability P(V)</th></tr><tr><td>0</td><td>1</td><td>1/4</td></tr><tr><td>1</td><td>2</td><td>2/4 or 1/2</td></tr><tr><td>2</td><td>1</td><td>1/4</td></tr><tr><td>Total</td><td>4</td><td>1</td></tr></table> The probability distribution of the random variable V can be written as follows: <table><tr><td>V</td><td>2</td><td>1</td><td>0</td></tr><tr><td>P(V)</td><td>1/4</td><td>1/2</td><td>1/4</td></tr></table>
5. Construct the probability histogram.	

Using Example 4 in the previous page,

Steps	Solution
1. List the sample space	S = {HHHH, HHHT, HHTH, HHTT, HTHH, HTHT, HTTH, HTTT, THHH, THHT, THTH, THTT, TTHH, TTHT, TTTH, TTTT}

2. Count the number of tails in each outcome and assign this number to this outcome.

Outcome	Number of tails (Value of T)
HHHH	0
HHHT	1
HHTH	1
HHTT	2
HTHH	1
HTHT	2
HTTH	2
HTTT	3
THHH	1
THHT	2
THTH	2
THTT	3
TTHH	2
TTHT	3
TTTH	3
TTTT	4

The values of the random variable T (number of tails) in this experiment are 0, 1, 2, 3, and 4.

3. Construct the frequency distribution of the values of the random variable T.

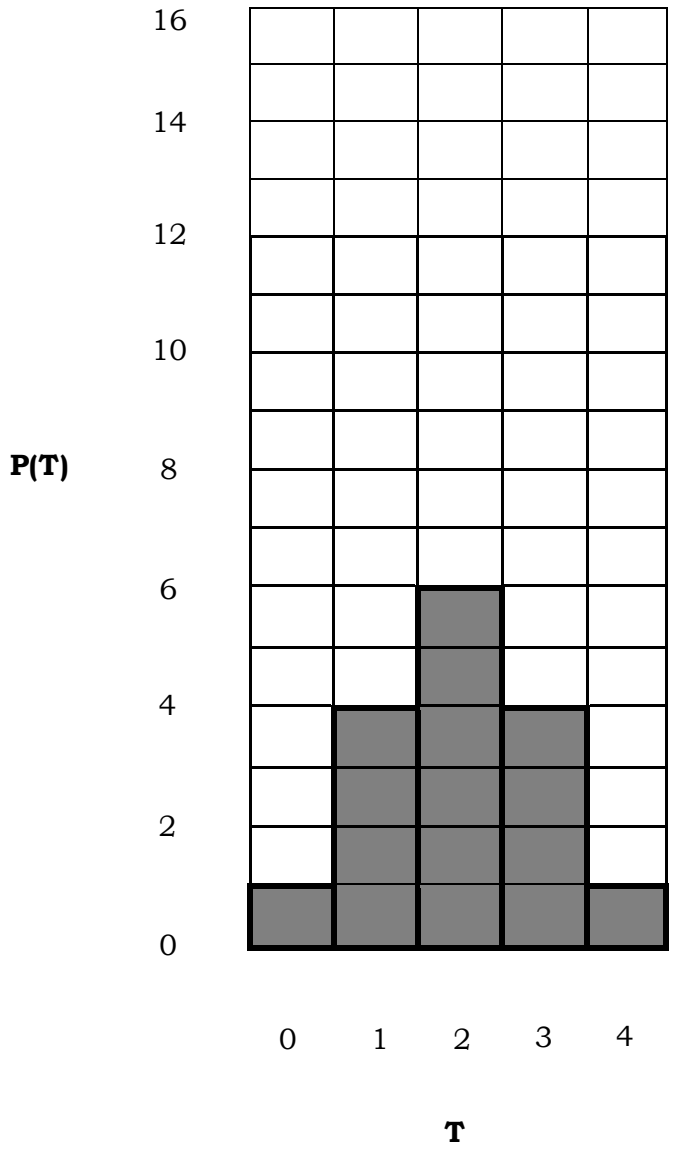
Number of Tails (Value of T)	Number of Occurrence (Frequency)
0	1
1	4
2	6
3	4
4	1
Total	16

4. Construct the probability distribution of the random variable T by getting the probability of occurrence of each value of the random variable.

Number of Tails (Value of T)	Number of Occurrence (Frequency)	Probability P(T)
0	1	1/16
1	4	4/16 or 1/4
2	6	6/16 or 3/8
3	4	4/16 or 1/4
4	1	1/16
Total	16	1

The probability distribution of the random variable T can be written as follows:

T	0	1	2	3	4
P(T)	1/16	1/4	3/8	1/4	1/16

5. Construct the probability histogram.	

Using Example 5 in the previous page,

Steps	Solution
1. List the sample space	S = {(1, 1), (1, 2), (1, 3), (1, 4), (1, 5), (1, 6), (2, 1), (2, 2), (2, 3), (2, 4), (2, 5), (2, 6), (3, 1), (3, 2), (3, 3), (3, 4), (3, 5), (3, 6), (4, 1), (4, 2), (4, 3), (4, 4), (4, 5), (4, 6), (5, 1), (5, 2), (5, 3), (5, 4), (5, 5), (5, 6), (6, 1), (6, 2), (6, 3), (6, 4), (6, 5), (6, 6)}

2. Count the sum of the number of dots in each outcome and assign this number to this outcome.

Outcome	Sum of the number of dots (Value of X)
(1, 1)	2
(1, 2), (2, 1)	3
(1, 3), (3, 1), (2, 2)	4
(1, 4), (4, 1), (2, 3), (3, 2)	5
(1, 5), (5, 1), (2, 4), (4, 2), (3, 3)	6
(1, 6), (6, 1), (2, 5), (5, 2), (4, 3), (3, 4)	7
(3, 5), (5, 3), (2, 6), (6, 2), (4, 4)	8
(5, 4), (4, 5), (6, 3), (3, 6)	9
(6, 4), (4, 6), (5, 5)	10
(5, 6), (6, 5)	11
(6, 6)	12

The values of the random variable X (sum of the number of dots) in this experiment are 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, and 12.

3. Construct the frequency distribution of the values of the random variable X.

Sum of the number of dots (Value of X)	Number of Occurrence (Frequency)
2	1
3	2
4	3
5	4
6	5
7	6
8	5
9	4
10	3
11	2

12	1
Total	36

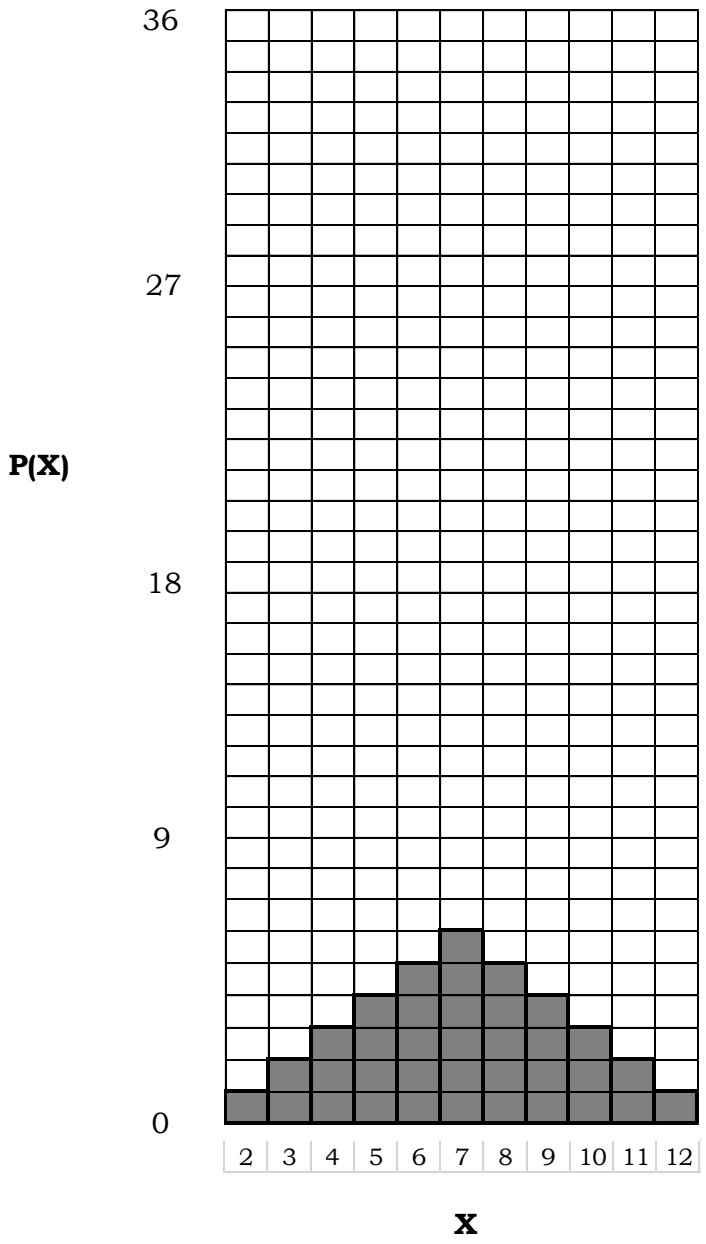
4. Construct the probability distribution of the random variable X by getting the probability of occurrence of each value of the random variable.

Sum of the number of dots (Value of X)	Number of Occurrence (Frequency)	Probability P(X)
2	1	1/36
3	2	2/36 or 1/18
4	3	3/36 or 1/12
5	4	4/36 or 1/9
6	5	5/36
7	6	6/36 or 1/6
8	5	5/36
9	4	4/36 or 1/9
10	3	3/36 or 1/12
11	2	2/36 or 1/18
12	1	1/36
Total	36	1

The probability distribution of the random variable X can be written as follows:

X	2	3	4	5	6	7	8	9	10	11	12
P(X)	$\frac{1}{36}$	$\frac{1}{18}$	$\frac{1}{12}$	$\frac{1}{9}$	$\frac{5}{36}$	$\frac{1}{6}$	$\frac{5}{36}$	$\frac{1}{9}$	$\frac{1}{12}$	$\frac{1}{18}$	$\frac{1}{36}$

5. Construct the probability histogram.



What's More

Direction: Complete the table below by constructing and illustrating the probability distribution of Example 3 *(refer to page 7)***.**

Steps	Solution
1. List the sample space	
2. Count the number of tails in each outcome and assign this number to this outcome.	
3. Construct the frequency distribution of the values of the given random variable.	
4. Construct the probability distribution of the given random variable by getting the probability of occurrence of each value of the random variable.	
5. Construct the probability histogram.	

What I Have Learned

Direction: Write your answer on a separate sheet of paper.

Answer the following in 2-3 sentences only.

1. How do you describe a discrete random variable?

2. How do you describe a continuous random variable?

3. Give three examples of discrete random variable.

4. Give three examples of continuous random variable.

5. What do you notice about the probability values of random variable in each probability distribution?

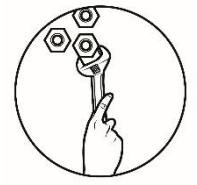
6. What is the sum of the probabilities of a random variable?

7. Why should the sum of the probabilities in a probability distribution is always equal to 1?

8. What is the shape of most probability distributions? Why do you think so?

Scoring Rubric

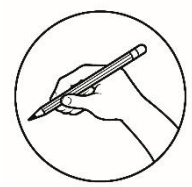
0	1	2	3	4
No answer at all	Correct answer but not in a sentence form.	Correct answer written in a sentence form but no supporting details. Did not use capitalization and punctuation. 3 or more spelling mistakes.	Correct answer written in a sentence form with 1 supporting detail from the text. Used capitalization and punctuation. 1-2 spelling mistakes.	Correct answer written in a sentence form with 2 or more supporting detail from the text. Used capitalization and punctuation. All words spelled correctly.



What I Can Do

Number of Defective COVID-19 Rapid Antibody Test Kit

Suppose three test kits are tested at random. Let D represent the defective test kit and let N represent the non-defective test kit. If we let X be the random variable for the number of defective test kits, construct the probability distribution of the random variable X.



Assessment

DIRECTION: Write your answer on a separate sheet of paper.

A. Multiple Choice. Choose the letter of the best answer.

1. If three coins are tossed, which is NOT a possible value of the random variable for the number of tails?
   A. 1
   B. 2
   C. 3
   D. 4

2. Which of the following is a discrete random variable?
   A. Length of electrical wires
   B. Number of pencils in a box
   C. Amount of sugar used in a cup of coffee
   D. Voltage of car batteries

3. Which formula gives the probability distribution shown by the table?

X	3	4	5
P(X)	1/3	¼	1/5

   A. P(X) = X
   B. P(X) = 1/X
   C. P(X) = X/3
   D. P(X) = X/5

4. How many ways can a "double" come out when you roll two dice?
   A. 2
   B. 4
   C. 6
   D. 8

5. It is a numerical quantity that is assigned to the outcome of an experiment.
   A. random variable
   B. variable
   C. probability
   D. probability distribution

B. Classify the following random variables as *discrete* or *continuous.*

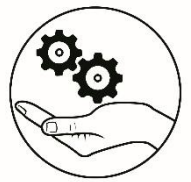
1. The weight of the professional boxers
2. The number of defective COVID-19 Rapid Antibody Test Kit

3. The area of lots in an exclusive subdivision
4. The number of recovered patients of COVID-19 per province
5. The number of students with Academic Excellence in a school per district

C. Determine the values of the random variables in each of the following distributions.

1. Two coins are tossed. Let H be the number of tails that occur. Determine the values of the random variable H.
2. A meeting of envoys was attended by 4 Koreans and 2 Filipinos. If three envoys were selected at random one after the other, determine the values of the random variable K representing the number of Koreans.

D. Construct the probability distribution of the situation below:
Two balls are drawn in succession without replacement from an urn containing 5 white balls and 6 black balls. Let B be the random variable representing the number of black balls. Construct the probability distribution of the random variable B.



Additional Activities

Grace Ann wants to determine if the formula below describes a probability distribution. Solve the following:

$P(X) = \frac{X+1}{6}$ where X = 0, 1, 2. If it is, find the following:

1. P(X = 2)
2. P(X ≥ 1)
3. P(X ≤ 1)

Answer Key

What I Know

A.
1. D
2. B
3. B
4. C
5. A

B.
1. Continuous
2. Discrete
3. Continuous
4. Continuous
5. Discrete

C.
1. 0, 1, 2
2. 0, 1, 2

What's In

A.
1. Experiment or trial
2. Sample Space
3. Event
4. Outcome
5. Probability

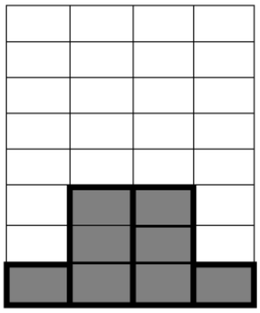
B.
1. 4
2. 8
3. 6
4. 36
5. 12

What's New

0, 1, 2, 3

What's More

No. of Red Balls	Frequency	P(R)
0	1	1/8
1	3	3/8
2	3	3/8
3	1	1/8
Total	8	1



What I Can Do

No. of Defective Test kit	Frequency	P(D)
0	1	1/8
1	3	3/8
2	3	3/8
3	1	1/8
Total	8	1

Assessment

A.
1. D
2. B
3. B
4. C
5. A

B.
1. Continuous
2. Discrete
3. Continuous
4. Discrete
5. Discrete

C.
1. 0, 1, 2
2. 0, 1, 2, 3

D.
S = {WW, WB, BW, BB}

Outcomes	Value of Variable B
WW	0
WB	1
BW	1
BB	2

No. of Black Balls	Frequency	P(B)
0	1	1/4
1	2	2/4 or 1/2
2	1	1/4
Total	4	1

Additional Activities

X	P(X)
0	1/6
1	1/3
2	1/2
Total	1

1. $P(X = 2) = 1/2$
2. $P(X \geq 1) = 5/6$
3. $P(X \leq 1) = 1/2$

References

Books

Belecina, R. R., Baccay, E. S., & Mateo, E. B. (2016).

Statistics and Probability. Rex Book Store.

Ocampo, J. J., & Marquez, W. G. (2016). *Senior High Conceptual Math & Beyond Statistics and Probability.* Brilliant Creations Publishing, Inc.

Website

britannica.com. (2021). Retrieved from Britannica: https://www.britannica.com/science/statistics/Random-variables-and-probability-distributions

courses.lumenlearning.com. (n.d.). Retrieved from lumen Boundless Statistics: https://courses.lumenlearning.com/boundless-statistics/chapter/discrete-random-variables/

For inquiries or feedback, please write or call:

Department of Education – Region III,
Schools Division of Bataan - Curriculum Implementation Division
Learning Resources Management and Development Section (LRMDS)

Provincial Capitol Compound, Balanga City, Bataan

Telefax: (047) 237-2102

Email Address: bataan@deped.gov.ph