

# DISCRETE RANDOM VARIABLES: PRACTICE 1: DISCRETE DISTRIBUTIONS\*

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## Abstract

This module provides students an opportunity to practice applying concepts related to discrete distributions. This practice exercise asks students to calculate several values based on the data provided.

## 1 Student Learning Objectives

- The student will investigate the properties of a discrete distribution.

## 2 Given:

A ballet instructor is interested in knowing what percent of each year's class will continue on to the next, so that she can plan what classes to offer. Over the years, she has established the following probability distribution.

- Let  $X$  = the number of years a student will study ballet with the teacher.
- Let  $P(X = x)$  = the probability that a student will study ballet  $x$  years.

## 3 Organize the Data

Complete the table below using the data provided.

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x	P(X=x)	x*P(X=x)
1	0.10	
2	0.05	
3	0.10	
4		
5	0.30	
6	0.20	
7	0.10	

Table 1

**Exercise 1**

In words, define the Random Variable  $X$ .

**Exercise 2**

$$P(X = 4) =$$

**Exercise 3**

$$P(X < 4) =$$

**Exercise 4**

On average, how many years would you expect a child to study ballet with this teacher?

**4 Discussion Question****Exercise 5**

What does the column " $P(X=x)$ " sum to and why?

**Exercise 6**

What does the column " $x * P(X=x)$ " sum to and why?