

1. State whether each of the following random variables is discrete or continuous.
  - a. The number of defective tires on a car.
  - b. The body temperature of a hospital patient
  - c. The number of pages in a book.
  - d. The number of draws (with replacement) from a deck of cards until a heart is selected.
  - e. The lifetime of a light bulb.
2. A point is randomly selected from the interior of a 1 foot square. Let  $x$  denote the distance from the lower left-hand corner of the square to the selected point. What are the possible values of  $x$ ? Is  $x$  discrete or continuous?
3. A box contains four slips of paper marked 1, 2, 3, and 4. Two slips are selected without replacement. List the possible values for each of the following random variables:
  - a.  $x$  = sum of the two numbers
  - b.  $y$  = difference between the first and second numbers.
  - c.  $z$  = number of slips selected that show an even number.
  - d.  $w$  = number of slips selected that show a 4.
4. Let  $x$  be the number of courses for which a randomly selected student at a certain university is registered. The probability distribution of  $x$  appears in the table below.

$x$	1	2	3	4	5	6	7
$P(x)$	0.02	0.03	0.09	0.25	0.4	0.16	0.05

- a. What is  $P(x = 4)$ ?
- b. What is  $P(x \leq 4)$ ?
- c. What is the probability that the selected student is taking at most five courses?
- d. What is the probability that the selected student is taking at least five courses? More than five courses?
- e. Calculate  $P(3 \leq x \leq 6)$  and  $P(3 < x < 6)$ . Explain in words why these two probabilities are different