

6.1 Class-work

- Statistical Literacy** Which of the following are continuous variables, and which are discrete?
 - Number of traffic fatalities per year in the state of Florida
 - Distance a golf ball travels after being hit with a driver
 - Time required to drive from home to college on any given day
 - Number of ships in Pearl Harbor on any given day
 - Your weight before breakfast each morning
- Statistical Literacy** Which of the following are continuous variables, and which are discrete?
 - Speed of an airplane
 - Age of a college professor chosen at random
 - Number of books in the college bookstore
 - Weight of a football player chosen at random
 - Number of lightning strikes in Rocky Mountain National Park on a given day
- Statistical Literacy** Consider each distribution. Determine if it is a valid probability distribution or not, and explain your answer.

(a)

x	0	1	2
$P(x)$	0.25	0.60	0.15

(b)

x	0	1	2
$P(x)$	0.25	0.60	0.20

- Basic Computation: Expected Value and Standard Deviation** Consider the probability distribution shown in Problem 3(a). Compute the expected value and the standard deviation of the distribution.
- Criminal Justice: Parole** *USA Today* reported that approximately 25% of all state prison inmates released on parole become repeat offenders while on parole. Suppose the parole board is examining five prisoners up for parole.

Let x = number of prisoners out of five on parole who become repeat offenders. The methods of Section 6.2 can be used to compute the probability assignments for the x distribution.

x	0	1	2	3	4	5
$P(x)$	0.237	0.396	0.264	0.088	0.015	0.001

- Find the probability that one or more of the five parolees will be repeat offenders. How does this number relate to the probability that none of the parolees will be repeat offenders?
- Find the probability that two or more of the five parolees will be repeat offenders.
- Find the probability that four or more of the five parolees will be repeat offenders.
- Compute μ , the expected number of repeat offenders out of five.
- Compute σ , the standard deviation of the number of repeat offenders out of five.

20. *Expand Your Knowledge: Linear Functions and Combinations of Independent Random Variables: Repair Service*

A computer repair shop has two work centers. The first center examines the computer to see what is wrong, and the second center repairs the computer. Let x_1 and x_2 be random variables representing the lengths of time in minutes to examine a computer (x_1) and to repair a computer (x_2). Assume x_1 and x_2 are independent random variables. Long-term history has shown the following times:

Examine computer, x_1 : $\mu_1 = 28.1$ minutes; $\sigma_1 = 8.2$ minutes

Repair computer, x_2 : $\mu_2 = 90.5$ minutes; $\sigma_2 = 15.2$ minutes

- Let $W = x_1 + x_2$ be a random variable representing the total time to examine and repair the computer. Compute the mean, variance, and standard deviation of W .
- Suppose it costs \$1.50 per minute to examine the computer and \$2.75 per minute to repair the computer. Then $W = 1.50x_1 + 2.75x_2$ is a random variable representing the service charges (without parts). Compute the mean, variance, and standard deviation of W .
- The shop charges a flat rate of \$1.50 per minute to examine the computer, and if no repairs are ordered, there is also an additional \$50 service charge. Let $L = 1.5x_1 + 50$. Compute the mean, variance, and standard deviation of L .