

Car Failures. In Exercises 19–22, refer to the accompanying table, which describes results of roadworthiness tests of Ford Focus cars that are 3 years old (based on data from the Department of Transportation). The random variable x represents the number of cars that failed among six that were tested for roadworthiness.

x	$P(x)$
0	0.377
1	0.399
2	0.176
3	0.041
4	0.005
5	0+
6	0+

19. Mean and Standard Deviation Find the mean and standard deviation for the numbers of cars that failed among the six cars that are tested.

20. Range Rule of Thumb for Unusual Events Use the range rule of thumb with the results from Exercise 19 to identify a range of values containing the usual numbers of car failures among six cars tested. Based on the result, is three an unusually high number of failures among six cars tested? Explain.

21. Using Probabilities for Unusual Events

- Find the probability of getting exactly three cars that fail among six cars tested.
- Find the probability of getting three or more cars that fail among six cars tested.
- Which probability is relevant for determining whether three is an unusually high number of failures among six cars tested: the result from part (a) or part (b)?
- Is three an unusually high number of failures? Why or why not?

22. Using Probabilities for Unusual Events

- Find the probability of getting exactly one car that fails among six cars tested.
- Find the probability of getting one or fewer cars that fail among six cars tested.
- Which probability is relevant for determining whether one is an unusually low number of cars that fail among six cars tested: the result from part (a) or part (b)?
- Is one an unusually low number of cars that fail among six cars tested? Why or why not?

5-2 Beyond the Basics

23. Expected Value for the Texas Pick 3 Game In the Texas Pick 3 lottery, you can bet \$1 by selecting three digits, each between 0 and 9 inclusive. If the same three numbers are drawn in the same order, you win and collect \$500.

- How many different selections are possible?
- What is the probability of winning?
- If you win, what is your net profit?
- Find the expected value.
- If you bet \$1 on the pass line in the casino dice game of craps, the expected value is -1.4% . Which bet is better: a \$1 bet in the Texas Pick 3 game or a \$1 bet on the pass line in craps? Explain.

24. Expected Value in Maine's Pick 4 Game In Maine's Pick 4 lottery game, you can pay \$1 to select a sequence of four digits, such as 1332. If you select the same sequence of four digits that are drawn, you win and collect \$5000.

- How many different selections are possible?
- What is the probability of winning?