Problems taken from “Fundamentals of Statistics, Fourth Edition” Chapters 6 & 7

In Problems 12, determine whether the distribution is a discrete

probability distribution. If not, state why.

**#12.**

x P(x)

1 0

2 0

3 0

4 0

5 1

In Problems 15 and 16, determine the required value of the missing probability to make the distribution a discrete probability distribution.

**#16.**

X P(x)

0 0.30

1 0.15

2 ?

3 0.20

4 0.15

5 0.05

**#20**

A Wendy’s manager performed a study to determine a probability distribution for the number of people, X, waiting in line during lunch. The results were as follows:

|  |  |  |  |
| --- | --- | --- | --- |
| x | P(x) x | P(x) |  |
| 0 | 0.011 7 | 7 | 0.098 |
| 1 | 0.035 8 | 8 | 0.063 |
| 2 | 0.089 9 | 9 | 0.035 |
| 3 | 0.150 10 | 10 | 0.019 |
| 4 | 0.186 11 | 11 | 0.004 |
| 5 | 0.172 12 | 12 | 0.006 |
| 6 | 0.132 |  |  |
| (a) Verify that this is a discrete probability distribution. | | | | | | | | |  |
| (c) Compute and interpret the mean of the random variable X.  (d) Compute the standard deviation of the random variable X. | | | | | | | | | |
| (e) What is the probability that eight people are waiting in line  **Section 6.2** | | | | | | | | | |
| *Determine which of the following probability experiments represents a binomial experiment. If the probability experiment is not a binomial experiment, state why.*  **#10**. A poll of 1200 registered voters is conducted in which the respondents are asked whether they believe Congress should reform Social Security.  *In Problems 29–34, (a) construct a binomial probability distribution with the given parameters; (b) compute the mean and standard deviation of the random variable using the methods of*  *Section 6.1; (c) compute the mean and standard deviation, using the methods of this section; and (d) draw the probability histogram, comment on its shape, and label the mean on the histogram.*  **#30. n = 8, p = 0.5** | | | | |  |  |  |  |  |

**#36.** According to the American Lung Association,

90% of adult smokers started smoking before turning 21 years

old. Ten smokers 21 years old or older are randomly selected,

and the number of smokers who started smoking before 21 is

recorded.

**Section 7.1**

**#26**

*In Problems 26, the graph of a normal curve is given. Use the*

*graph to identify the values of μ and σ.*

**#30.** Draw a normal curve with μ = 50 and σ = 5. Label the mean and the inﬂection points.

**Section 7.2** *In Problems 6–10, ﬁnd the indicated areas. For each problem, be*

*sure to draw a standard normal curve and shade the area that is to*

*be found.*

**#6.**

Determine the area under the standard normal curve that lies

to the left of

(a) z = -3.49 (b) z = -1.99

(c) z = 0.92 (d) z = 2.90

**#** **8.** Determine the area under the standard normal curve that lies

to the right of

(a) z = -3.49 (b) z = -0.55

(c) z = 2.23 (d) z = 3.45

**# 10.** Determine the area under the standard normal curve that lies between

(a) z = -2.55 and z = 2.55

(b) z = -1.67 and z = 0

(c) z = -3.03 and z = 1.98

**#16***. In Problems 16, ﬁnd the indicated z-score. Be sure to draw a standard normal curve that depicts the solution*.

Find the z-score such that the area under the standard normal

curve to its right is 0.35.

In Problems 20, ﬁnd the value of zα.

**#20. z0.02**

*In Problems 24 & 28, assume that the random variable X is normally*

*distributed, with mean m = 50 and standard deviation s = 7***.**

Compute the following probabilities. Be sure to draw a normal

curve with the area corresponding to the probability shaded.

**# 24**. P(X> 65)

**# 28.** P(56 < X< 68)

*In Problems 34, assume that the random variable X is*

*normally distributed, with mean m = 50 and standard deviation*

*s = 7. Find each indicated percentile for X.*

**34. The 90th percentile**

**Section 7.4**

**#22.** Smokers According to Information Please Almanac, 80%

of adult smokers started smoking before they were 18 years old.

Suppose 100 smokers 18 years old or older are randomly selected.

Use the normal approximation to the binomial to

(a) approximate the probability that exactly 80 of them started

smoking before they were 18 years old.

(b) approximate the probability that at least 80 of them started

smoking before they were 18 years old.

(c) approximate the probability that fewer than 70 of them

started smoking before they were 18 years old.

**# 28**. Liars According to a USA Today “Snapshot,” 3%

of Americans surveyed lie frequently. You conduct a survey of

500 college students and ﬁnd that 20 of them lie frequently.

(a) Compute the probability that, in a random sample of 500

college students, at least 20 lie frequently, assuming the true

percentage is 3%.

(b) Does this result contradict the USA Today “Snapshot”?

Explain?