[The following information applies to the questions displayed below.]
Four women's college basketball teams are participating in a single-elimination holiday basketball tournament. If one team is favored in its semifinal match by odds of 1.85 to 1.15 and another squad is favored in its contest by odds of 2.65 to 1.35 , what is the probability that:

## 1. Award: $\mathbf{1 0 . 0 0}$ points

a. Both favored teams win their games? (Round your answer to 4 decimal places.)

Probability $\square$

References
Worksheet Difficulty: $2 \quad$ Learning Objective: 05-04 Calculate
Intermediate probabilities using the rules of multiplication.

## 2. Award: $\mathbf{1 0 . 0 0}$ points

b. Neither favored team wins its game? (Round your answer to 4 decimal places.)

Probability $\square$

References
Worksheet Difficulty: $2 \quad$ Learning Objective: 05-04 Calculate Intermediate probabilities using the rules of multiplication.

## 3. Award: $\mathbf{1 0 . 0 0}$ points

c. At least one of the favored teams wins its game? (Round your answer to 4 decimal places.) Probability $\square$

References

Worksheet Difficulty: 2 Intermediate

Learning Objective: 05-04 Calculate probabilities using the rules of multiplication.
[The following information applies to the questions displayed below.]
A sample of 35 oil industry executives was selected to test a questionnaire. One question about environmental issues required a yes or no answer.

## 4. Award: 10.00 points

b. Which of the following are possible events. (Select all that apply.)
$\square 32$ people respond "Yes."
$\square 31$ people respond "Yes."
, 18 people respond "No."
$\square 41$ people respond "No."
$\square$ The questionnaire fails to reach one executive.

## References

Check All Difficulty: 1 Basic Learning Objective: 05-02 Assign<br>That Apply<br>probabilities using a classical, empirical, or subjective approach

## 5. Award: $\mathbf{1 0 . 0 0}$ points

c. Sixteen of the 35 executives responded yes. Based on these sample responses, what is the probability that an oil industry executive will respond yes? (Round your answer to 2 decimal places.)

Probability

References
Worksheet Difficulty: 1 Basic Learning Objective: 05-02 Assign
probabilities using a classical, empirical, or subjective approach.

## 6. Award: 10.00 points

d. What concept of probability does this illustrate?
(Click to select)

References
Worksheet Difficulty: 1 Basic Learning Objective: 05-02 Assign
probabilities using a classical, empirical, or subjective approach.

## 7. Award: $\mathbf{1 0 . 0 0}$ points

e. Are each of the possible outcomes equally likely and mutually exclusive?
(Click to select) $\hat{v}$
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## References

Worksheet Difficulty: 1 Basic Learning Objective: 05-02 Assign probabilities using a classical, empirical, or subjective approach.

## 8. Award: 10.00 points

The events $A$ and $B$ are mutually exclusive. Suppose $P(A)=.37$ and $P(B)=.33$.
a. What is the probability of either $A$ or $E$ occuring? (Round your answer to 2 decimal places.)

Probability of either $A$ or $B$ $\square$
b.

What is the probability that neither $A$ nor $B$ will happen? (Round your answer to 2 decimal places.)

Probability of neither $A$ nor $B$ $\square$

## References

| Worksheet | Difficulty: 2 | Learning Objective: 05-03 Calculate |
| :--- | :--- | :--- |
|  | Intermediate | probabilities using the rules of addition. |

## 9. Award: $\mathbf{1 0 . 0 0}$ points

The credit department of Lion's Department Store in Anaheim, California, reported that 30\% of their sales are cash, $28 \%$ are paid with a credit card, and $42 \%$ with a debit card. Twenty percent of the cash purchases, $90 \%$ of the credit card purchases, and $60 \%$ of the debit card purchases are for more than $\$ 50$.

Ms. Tina Stevens just purchased a new dress that cost $\$ 120$. What is the probability that she paid cash? (Round your answer to 3 decimal places.)

Probability $\square$

## References

Worksheet<br>Difficulty: 3<br>Learning Objective: 05-06 Calculate<br>Challenge<br>probabilities using Bayes' theorem.

## 10. Award: $\mathbf{1 0 . 0 0}$ points

An Internet company located in Southern California has season tickets to the Los Angeles Lakers basketball games. The company president always invites one of the 5 vice presidents to attend games with him, and claims he selects the person to attend at random. One of the 5 vice presidents has not been invited to attend any of the last 7 Lakers home games.

What is the likelihood this could be due to chance? (Round your answer to 3 decimal places.)
Likelihood $\square$

References

| Worksheet | Difficulty: 2 <br> Intermediate | Learning Objective: 05-04 Calculate <br> probabilities using the rules of <br> multiplication. |
| :---: | :--- | :--- |

## 11. Award: 10.00 points

A survey of 39 students at the Wall College of Business showed the following majors:

| Accounting | 10 |
| :--- | ---: |
| Finance | 6 |
| Economics | 3 |
| Management | 10 |

Suppose you select a student and observe his or her major.
a. What is the probability he or she is a management major? (Round your answer to 3 decimal places.)

Probability

b. Which concept of probability did you use to make this estimate?

Probability (Click to select) $\hat{v}$

References
Worksheet Difficulty: 1 Basic Learning Objective: 05-02 Assign probabilities using a classical, empirical, or subjective approach.

## 12. Award: 10.00 points

The events $X$ and $Y$ are mutually exclusive. Suppose $P(X)=.14$ and $P(Y)=.12$.

1. What is the probability of either $X$ or $Y$ occurring? (Round your answer to 2 decimal places.)

Probability $\square$
2. What is the probability that neither $X$ nor $Y$ will happen? (Round your answer to 2 decimal places.)

Probability $\square$

References
Worksheet Difficulty: 2
Learning Objective: 05-03 Calculate Intermediate probabilities using the rules of addition.

## 13. Award: 10.00 points

According to the "January theory," if the stock market is up for the month of January, it will be up for the year. If it is down in January, it will be down for the year. According to an article in The Wall Street Journal, this theory held for 27 out of the last 34 years. Suppose there is no truth to this theory; that is, the probability it is either up or down is 0.5 .

What is the probability this could occur by chance? (Round your answer to 6 decimal places.)
Probability $\square$

References

Worksheet Difficulty: 3 Learning Objective: 06-04 Explain the
Challenge assumptions of the binomial distribution and apply it to calculate probabilities.

## 14. Award: 10.00 points

In a binomial distribution, $n=8$ and $\pi=.25$. Find the probabilities of the following events. (Round your answers to 4 decimal places.)
a. $x=2$.

Probability

b. $x \leq 2$.

Probability $\square$
c. $x \geq 3$.

Probability $\square$

References
Worksheet Difficulty: 2 Learning Objective: 06-04 Explain the Intermediate assumptions of the binomial distribution and apply it to calculate probabilities.

## 15. Award: 10.00 points

Industry standards suggest that 10 percent of new vehicles require warranty service within the first year. Jones Nissan in Sumter, South Carolina, sold 12 Nissans yesterday. (Round your mean answer to 2 decimal places and the other answers to 4 decimal places.)
a. What is the probability that none of these vehicles requires warranty service?

Probability $\square$
b. What is the probability exactly one of these vehicles requires warranty service?

Probability $\square$
c. Determine the probability that exactly two of these vehicles require warranty service.

Probability $\square$
d. Compute the mean and standard deviation of this probability distribution.

Mean $\mu$
Standard deviation $\sigma$


## References

| Worksheet | Difficulty: 2 <br> Intermediate | Learning Objective: 06-04 Explain the <br> assumptions of the binomial distribution <br> and apply it to calculate probabilities. |
| :--- | :--- | :--- |

## 16. Award: $\mathbf{1 0 . 0 0}$ points

The Internal Revenue Service is studying the category of charitable contributions. A sample of 26 returns is selected from young couples between the ages of 20 and 35 who had an adjusted gross income of more than $\$ 100,000$. Of these 26 returns, 6 had charitable contributions of more than $\$ 1,000$. Suppose 5 of these returns are selected for a comprehensive audit.
a You should use the hypergeometric distribution is appropriate. Because
b. What is the probability exactly one of the five audited had a charitable deduction of more than $\$ 1,000$ ? (Round your answer to 4 decimal places.)

Probability

c. What is the probability at least one of the audited returns had a charitable contribution of more than $\$ 1,000$ ? (Round your answer to 4 decimal places.)

Probability $\square$

References

Worksheet Difficulty: 1 Basic
Learning Objective: 06-05 Explain the assumptions of the hypergeometric distribution and apply it to calculate probabilities.

## 17. Award: $\mathbf{1 0 . 0 0}$ points

On September 18, 2003, hurricane Isabel struck the North Carolina Coast, causing extensive damage. For several days prior to reaching land the National Hurricane Center had been predicting the hurricane would come on shore between Cape Fear, North Carolina, and the North Carolina-Virginia border. It was estimated that the probability the hurricane would actually strike in this area was 0.94 . In fact, the hurricane did come on shore almost exactly as forecast and was almost in the center of the strike area.


The National Hurricane Center forecasts that the hurricane will hit the strike area with a probability of 0.94 .
a. What probability distribution does this follow?
(Click to select)
b. If there are 11 hurricanes this season, what is the probability that all reach the strike area? (Round your answer to 4 decimal places.)

Probability $\square$
c. What is the probability at least one of 11 hurricanes reaches land outside the strike area? (Round your answer to 4 decimal places.)

Probability $\square$

## References

Worksheet Difficulty: $2 \quad$ Learning Objective: 06-04 Explain the Intermediate assumptions of the binomial distribution and apply it to calculate probabilities.

## 18. Award: 10.00 points

In a recent survey, 30 percent indicated chocolate was their favorite flavor of ice cream. Suppose we select a sample of nine people and ask them to name their favorite flavor of ice cream.
a. How many of those in the sample would you expect to name chocolate? (Round your answer to the nearest whole number.)

Expected number of people $\square$
b. What is the probability exactly three of those in the sample name chocolate? (Round your answer to 4 decimal places.)

Probability $\square$
c. What is the probability three or more name chocolate? (Round your answer to 4 decimal places.)

Probability $\square$

## References

| Worksheet | Difficulty: 2 <br> Intermediate | Learning Objective: 06-04 Explain the <br> assumptions of the binomial distribution <br> and apply it to calculate probabilities. |
| :--- | :--- | :--- |

## 19. Award: 10.00 points

Compute the mean and variance of the following probability distribution. (Round your answers to 2 decimal places.)

| $X$ | $P(X)$ |
| :---: | :---: |
| 7 | .10 |
| 10 | .30 |
| 13 | .20 |
| 16 | .40 |


| Mean | $\square$ |
| :--- | :--- |
| Variance | $\square$ |

## References

Worksheet Difficulty: 1 Basic $\quad$| Learning Objective: 06-03 Compute the |
| :--- |
| mean, variance, and standard deviation |
| of a discrete probability distribution. |

## 20. Award: $\mathbf{1 0 . 0 0}$ points

A study of long-distance phone calls made from General Electric Corporate Headquarters in Fairfield, Connecticut, revealed the length of the calls, in minutes, follows the normal probability distribution. The mean length of time per call was 3.90 minutes and the standard deviation was 0.60 minutes.
a. What fraction of the calls last between 3.90 and 4.50 minutes? (Round $\mathbf{z}$-score computation to 2
decimal places and your final answer to 4 decimal places.)
Fraction of calls

b. What fraction of the calls last more than 4.50 minutes? (Round z-score computation to 2 decimal places and your final answer to 4 decimal places.)

Fraction of calls

c. What fraction of the calls last between 4.50 and 5.50 minutes? (Round $z$-score computation to 2 decimal places and your final answer to 4 decimal places.)

Fraction of calls $\square$
d. What fraction of the calls last between 3.50 and 5.50 minutes? (Round z-score computation to 2 decimal places and your final answer to 4 decimal places.)

## Fraction of calls

$\square$
e. As part of her report to the president, the director of communications would like to report the length of the longest (in duration) 3 percent of the calls. What is this time? (Round z-score computation to 2 decimal places and your final answer to 2 decimal places.)

Duration $\square$

References
Worksheet Difficulty: 1 Basic Learning Objective: 07-03 Describe the standard normal probability distribution and use it to calculate probabilities.

## 21. Award: 10.00 points

According to the South Dakota Department of Health, the number of hours of TV viewing per week is higher among adult women than adult men. A recent study showed women spent an average of 35 hours per week watching TV, and men, 31 hours per week. Assume that the distribution of hours watched follows the normal distribution for both groups, and that the standard deviation among the women is 4.2 hours and is 4.8 hours for the men.
a. What percent of the women watch TV less than 38 hours per week? (Round z-score computation to 2 decimal places and your final answer to 4 decimal places.)

Probability $\square$
b. What percent of the men watch TV more than 25 hours per week? (Round z-score computation to 2

## decimal places and your final answer to 4 decimal places.)

Probability $\square$
c. How many hours of TV do the two percent of women who watch the most TV per week watch? Find the comparable value for the men. (Round your answers to 3 decimal places.)

|  | Number of hours |
| :--- | ---: |
| Women | $\square$ |
| Men | $\square$ |

## References

| Worksheet | Difficulty: 2 | Learning Objective: 07-03 Describe the <br> Intermediate |
| :--- | :--- | :--- |
|  |  | standard normal probability distribution <br> and use it to calculate probabilities. |

[The following information applies to the questions displayed below.]

The cost per item at a supermarket follows an exponential distribution. There are many inexpensive items and a few relatively expensive ones. The mean cost per item is $\$ 10.00$. What is the percentage of items that cost:

## 22. Award: 10.00 points

a. Less than $\$ 7.00$ ? (Round your answer to 4 decimal places.)

Probability $\square$

## References

| Worksheet | Difficulty: 2 <br> Intermediate | Learning Objective: 07-05 Describe the <br> exponential probability distribution and <br> use it to calculate probabilities. |
| :--- | :--- | :--- |

## 23. Award: $\mathbf{1 0 . 0 0}$ points

b. More than $\$ 11.00$ ? (Round your answer to 4 decimal places.)

Probability

## References

| Worksheet | Difficulty: 2 | Learning Objective: 07-05 Describe the <br> exponential probability distribution and <br> Intermediate |
| :--- | :--- | :--- |
|  |  | use it to calculate probabilities. |

## 24. Award: $\mathbf{1 0 . 0 0}$ points

c. Between $\$ 8.00$ and $\$ 10.00$ ? (Round your answer to 4 decimal places.)

Probability $\square$

References
Worksheet Difficulty: 2
Learning Objective: 07-05 Describe the Intermediate exponential probability distribution and use it to calculate probabilities.

## 25. Award: 10.00 points

d. Find the 50th percentile. Fifty percent of the supermarket items cost more than what amount? (Round your answer to 2 decimal places.)

Amount $\square$

## References

Worksheet Difficulty: 2 Learning Objective: 07-05 Describe the Intermediate exponential probability distribution and use it to calculate probabilities.

## 26. Award: 10.00 points

The mean of a normal probability distribution is 460 ; the standard deviation is 14 .
a. About $68 \%$ of the observations lie between what two values?

b. About $95 \%$ of the observations lie between what two values?

Value 1
Value 2 $\square$
c. Practically all of the observations lie between what two values?

Value 1
Value 2

## References

Worksheet Difficulty: 1 Basic Learning Objective: 07-03 Describe the standard normal probability distribution and use it to calculate probabilities.

## 27. Award: 10.00 points

A normal population has a mean of 22 and a standard deviation of 5 .
a. Compute the $z$ value associated with 25. (Round your answer to 2 decimal places.)

Z $\square$
b. What proportion of the population is between 22 and 25 ? (Round z-score computation to 2 decimal places and your final answer to 4 decimal places.)

Proportion $\square$
c. What proportion of the population is less than 18 ? (Round z-score computation to 2 decimal places and your final answer to 4 decimal places.)

Proportion

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## References

| Worksheet | Difficulty: 2 <br> Intermediate | Learning Objective: 07-03 Describe the <br> standard normal probability distribution <br> and use it to calculate probabilities. |
| :---: | :--- | :--- |

## 28. Award: 10.00 points

The closing price of Schnur Sporting Goods Inc. common stock is uniformly distributed between $\$ 21$ and \$37 per share.

What is the probability that the stock price will be:
a. More than $\$ 30$ ? (Round your answer to 4 decimal places.)

Probability $\square$
b. Less than or equal to $\$ 27$ ? (Round your answer to 4 decimal places.)

Probability $\square$

References

Worksheet Difficulty: 1 Basic Learning Objective: 07-01 Describe the uniform probability distribution and use it to calculate probabilities.

