Exam
Name___________________________________

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Solve the problem.

1) Solve the system of linear equations:
\[
\begin{align*}
2x + 2y &= 1 \\
3x - y &= 6
\end{align*}
\]

2) Consider the following system of linear inequalities.
\[
\begin{align*}
5x + y &\leq 100 \\
5x + 9y &\leq 180 \\
x + y &\geq 5 \\
x &\geq 0, \quad y &\geq 0
\end{align*}
\]
(a) Graph the feasible set determined by the system.
(b) Find the coordinates of all of the vertices of the feasible set.

3) Graph the feasible set for the system of inequalities
\[
\begin{align*}
y &\leq 2x - 3 \\
y &\geq 0
\end{align*}
\]
by shading the region of those points which do not satisfy the system.

4) Solve the system of linear equations:
\[
\begin{align*}
y &= 5x - 3 \\
y &= -3x - 11
\end{align*}
\]
5) Consider the following system of linear inequalities:
\[
\begin{align*}
2x + 3y & \leq 9 \\
x + y & \leq 4 \\
x & \geq 0, \ y & \geq 0
\end{align*}
\]
(a) Graph the feasible set of the system.

(b) Find the coordinates of vertices of the feasible set.

Find the equation for the line described.
6) Perpendicular to \( y = -\frac{3}{2}x + 2 \) and passing through the point \((0, 0)\).

7) The line through \((1, 2)\) and \((-2, 11)\)

Solve the problem.
8) Determine the least-square error when the line \( y = 2x + 2.5 \) is used to approximate the data points \((1, 5), (3, 8)\) and \((6, 15)\).

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

9) The slope of the line \( y = 3 \) is
A) 1.
B) \( \frac{1}{3} \).
C) 0.
D) 3.
E) none of the above.

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Find the equation for the line described.
10) The line passing through the point \((2, 3)\) and having slope -4
Solve the problem.

11) Consider the following feasible set (FS) for the maximization of $3x + 2y$:

(a) What is the maximum of $3x + 2y$?
(b) Does this maximum occur at a unique point?

12) Consider the linear programming problem below.
Maximize $x + 5y$ subject to $y \geq 2, x \geq 0, x - y \leq 0, y \leq \frac{1}{2}x + 9$

(a) Graph the system of inequalities and outline the boundary of the feasible set. Label the feasible set FS. Also, label the vertices of the feasible set.

(b) Find the maximum value of the objective function, and where it occurs.

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

A candy merchant sells two variety bags of candy. Each pound of variety bag A contains 60% caramels and 40% chocolates and sells for $8 a pound. Each pound of variety bag B contains 45% caramels and 55% chocolates and sells for $10 a pound. The merchant has available 400 pounds of caramels and 300 pounds of chocolate. The merchant will try to sell the amount of each blend that maximizes her income. Let $x$ be the number of pounds of variety bag A and $y$ be the number of pounds of variety bag B.

13) Since the merchant above has available 300 pounds of chocolates, one inequality that must be satisfied is

in the situation above is
A) $.45x + .55y \leq 300$
B) $.40x + .55y \leq 300$
C) $.60x + .40y \leq 300$
D) $.60x + .45y \leq 300$
E) none of the above
A small manufacturing plant produces three kinds of bicycles—three-speed, five-speed and ten-speed—in two factories. Factory $A$ produces 16 three-speeds, 12 five-speeds and 30 ten-speeds in one day, while factory $B$ produces 15 three-speeds, 18 five-speeds and 20 ten-speeds in one day. An order is received for 30 three-speeds, 40 five-speeds, and 50 ten-speeds. It costs $1200 a day to operate factory $A$ and $3000 a day to operate factory $B$. The manufacturer chooses the number of days to operate each factory in order to minimize cost.

14) In the situation above, the objective function is
   A) $30x + 40y + 50z$
   B) $3000x + 1200y$
   C) $58x + 53y$
   D) $1200x + 3000y$
   E) none of the above

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Solve the problem.

15) Tee-Tops Inc. has warehouses in San Francisco and Oakland and some stores in Berkeley and San Jose. The Berkeley store needs 4000 tee shirts and the San Jose store needs 7000 tee shirts. The Oakland warehouse has 9000 tee shirts, whereas the San Francisco warehouse has 8000 tee shirts. The cost of shipping a tee shirt from Oakland to Berkeley is $0.05, from Oakland to San Jose $0.15, from San Francisco to Berkeley $0.03, and from San Francisco to San Jose $0.12. The number of tee shirts that are shipped from each warehouse to each store is chosen in order to minimize shipping costs.
   (a) Define the variables.
   (b) Write the system of linear inequalities used in solving the problem.
   (c) Write an algebraic expression for the objective function.

Determine whether the given point is in the feasible set of a linear programming problem with constraints. Justify your answer.

16) (8, 3)

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

17) In the situation above, which of the following inequalities must be satisfied?
   A) $x + y + z \geq 120$
   B) $x + y \geq 120$
   C) $30x + 20y \leq 50$
   D) $16x + 15y \geq 30$
   E) none of the above

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.
MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

19) Consider the feasible set (FS) below of a certain linear programming problem.

The maximum value of the objective function \(6x + 3y\) is

A) 20.
B) 12.
C) -6.
D) 24.
E) none of the above

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Determine whether the given point is in the feasible set of a linear programming problem with constraints. Justify your answer.

\[
\begin{align*}
&x + y \leq 10 \\
&2x + 3y \geq 12 \\
&x \geq 0, \ y \geq 0
\end{align*}
\]

20) (3, 7)

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

21) How many three-letter words can be formed allowing repetition of letters?

A) 326
B) 3 \cdot 26
C) 263
D) 26 \cdot 25 \cdot 24
E) none of the above

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Solve the problem.

22) Try to calculate \(\binom{20}{4, 5, 6, 7}\). What is incorrect about this expression?

Suppose that \(U = \{a, b, c, d, e\}, A = \{a, e\}, B = \{a, b\}, \text{ and } C = \{a, b, c\}.

List the elements of the indicated set.

23) \((A \cup B) \cap C\)

Solve the problem.

24) Determine the middle term in the binomial expansion of \((x + y)^{14}\).
25) Draw a two-circle Venn diagram and shade the portion corresponding to the set $A \cup B$.

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

26) Evaluate $\binom{8}{7}$.
   
   A) 40,320  
   B) 5040  
   C) 8  
   D) $\frac{8}{7}$  
   E) none of the above

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Solve the problem.

27) How many 4-letter words can be made from the letters of "MISSISSIPPI" if the words must begin with an S and letters cannot be repeated?

28) Find the coefficient of $x^4y^5$ in the binomial expansion of $(x + y)^9$.

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

29) How many three-digit codes can be formed using the digits 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 if the last digit cannot be 0 or 1 and repetition of digits is allowed?
   
   A) 512  
   B) 800  
   C) 720  
   D) 504  
   E) none of the above

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Solve the problem.

30) An urn contains four red balls and six white balls. A sample of four balls is selected.
   (a) How many samples are possible?
   (b) How many samples contain exactly three white balls?
   (c) How many samples contain four white balls?

31) Of 95 students, 62 are foreign, and of those 62 foreign students, 23 are female. If 45 of the students are male, how many female students are not foreign?

32) In how many ways can you choose two groups of four people from among eight people?

33) Draw a two-circle Venn diagram and shade the portion corresponding to the set $(A \cup B)'$.

Let $U = \{1, 3, 5, 7, 9, 11\}$, $A = \{1, 5, 9, 11\}$, $B = \{3, 5, 7\}$, and $C = \{1, 3, 11\}$.

List the elements of the indicated set.

34) $A \cap (B \cup C)$

Solve the problem.

35) A coin is tossed eight times and the sequence of heads and tails is observed.
   (a) How many different outcomes are possible?
   (b) How many different outcomes have exactly two tails?
   (c) How many different outcomes have at least two tails?
Three boxes—I, II, and III—contain three red and two green chips, two red and four green chips, and four red and five green chips, respectively. A box is selected at random and a chip is drawn at random from the box.

36) In the situation above, what is the probability that the chip is green?  

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

37) Let $E$ and $F$ be events such that $\Pr(F) = 0.4$ and $\Pr(E \cap F) = 0.3$. Compute $\Pr(E' \cap F)$.
   A) 0.05  
   B) 0.006  
   C) 0.10  
   D) 0.55  
   E) none of the above

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

38) An coin is to be tossed 10 times. What is the probability of obtaining 7 heads and 3 tails?

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

39) If $E$ and $F$ are mutually exclusive and $\Pr(E) = 0.2$ and $\Pr(F) = 0.6$, then $\Pr(E \cup F)$ is
   A) 0.12.  
   B) 0.8.  
   C) 0.  
   D) 1.  
   E) none of the above

40) Of the 1000 freshmen enrolled at a certain college, 100 have verbal SAT scores above 650. Thirty of these 100 students earned an A in freshman composition. The probability that a freshman has a verbal SAT score above 650 and earned an A in freshman composition is
   A) $\frac{3}{100}$  
   B) $\frac{13}{100}$  
   C) $\frac{1}{10}$  
   D) impossible to determine.  
   E) none of the above

Suppose that 30% of all small businesses are undercapitalized, 40% of all undercapitalized small business fail, and 20% of all small businesses that are not undercapitalized fail.

41) A small business is chosen at random. Based on the statistics above, the probability that the small business succeeds is
   A) 0.74.  
   B) 0.88.  
   C) 0.60.  
   D) 0.56.  
   E) none of the above
Fifty percent of students enrolled in an astronomy class have previously taken physics. Thirty percent of these students received an A for the astronomy class, whereas twenty percent of the other students received an A for astronomy. Find the probability that a student selected at random
42) received an A in the astronomy course.
   A) .25
   B) .50
   C) .45
   D) .10
   E) none of the above

43) Which of the following events are mutually exclusive?
   A) being a steelworker and being a stamp collector
   B) living in Baltimore and working in Washington, D.C.
   C) being a mother and being an uncle
   D) being a college student and being a high school graduate
   E) none of the above

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

A local store orders lightbulbs from two suppliers, AAA Electronics and ZZZ Electronics. The local store purchases 30% of the bulbs from AAA and 70% of the bulbs from ZZZ. Two percent of the bulbs from AAA are defective while 3% of the bulbs from ZZZ are defective. Find the probability that 44) was purchased from ZZZ and is not defective.

The probability that a person passes organic chemistry the first time he enrolls is 0.8. The probability that a person passes organic chemistry the second time he enrolls is 0.9.

45) Find the probability that a person fails the first time but passes the second time.

Solve the problem.

46) A coin is to be tossed 10 times. What is the probability that at least 8 heads appear?

47) A pair of dice is tossed as many times as needed until the sum of the dots on the uppermost faces is either 6 or 9.
   (a) What is the probability of obtaining the 6 before the 9?
   (b) What is the probability of obtaining the 9 before the 6?

A coin has Pr(T)=\frac{1}{4}. If it is tossed six times in succession, find the probability of getting

48) exactly four tails.
The figure below shows a partial map of the streets in a certain city. A tourist starts at point $A$ and selects at random a path to point $B$ with no backtracking.

49) Based on the figure above, compute the probability that the tourist passes through points $C$ and $D$.

Solve the problem.

50) Let $E$ and $F$ be events such that $\Pr(E) = 0.7$, $\Pr(F) = 0.5$, $\Pr(E \cap F) = 0.3$. Find $\Pr(E \cup F)$.

The staff of a clinic knows from literature distributed by a pharmaceutical company that $\frac{1}{7}$ of the patients given a certain drug will have bad side effects. Suppose that the clinic gives 294 patients this drug. Use an approximating normal curve to estimate the probability that

51) none will have any bad side effects.

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

52) Your scores on three tests in finite mathematics are 76, 88, and 72. Your grade on the final exam will count twice as much as any one test grade in determining your average grade for the course. In order for your average grade for the course to be 82, your grade on the final exam must be
   A) 85.
   B) 87.
   C) 92.
   D) 77.
   E) none of the above

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Solve the problem.

53) The number of accidents per week on a certain highway was recorded over a 40-week period, and the results are summarized below.

<table>
<thead>
<tr>
<th>Number of accidents</th>
<th>Number of occurrences</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>1</td>
<td>12</td>
</tr>
<tr>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
</tr>
</tbody>
</table>

(a) Determine the relative frequency distribution for the number of accidents per week.
(b) What is the highest number of accidents per week.
(c) What is the number of accidents per week with the highest frequency?
MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

54) Given the following five-number summary, find the interquartile range.  
   29, 37, 50, 66, 94  
   A) 29  
   B) 50  
   C) 65  
   D) 32.5

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Solve the problem.

55) Let \( X \) denote the number of girls in a family with four children. Determine the probability distribution of \( X \).

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

56) Consider the probability distribution below.

<table>
<thead>
<tr>
<th>( k )</th>
<th>( \Pr(X = k) )</th>
</tr>
</thead>
<tbody>
<tr>
<td>-2</td>
<td>0.1</td>
</tr>
<tr>
<td>0</td>
<td>0.2</td>
</tr>
<tr>
<td>1</td>
<td>0.1</td>
</tr>
<tr>
<td>2</td>
<td>0.2</td>
</tr>
<tr>
<td>3</td>
<td>0.4</td>
</tr>
</tbody>
</table>

The mean is
A) 3.0.  
B) 1.0.  
C) 0.8.  
D) 1.5.  
E) none of the above

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Solve the problem.

57) Your friend wants to play a game with a pair of dice. You win if the sum of the top faces is 5, 6, 7, or 8. The winner pays the loser $1 each game. Should you play?

58) On a new version of the Price is Right, a bag contains two white chips and four red chips. A contestant receives $5000 if they draw two white balls, $1000 if the draw one white ball and lose if they draw two red balls. Determine the probability distribution for playing the game.

59) It is estimated that 1% of all items coming off an assembly line are defective. Let \( X \) be the number of defective items in a random sample of 1,000 items from the assembly line. Compute
(a) the mean of \( X \)  
(b) the variance of \( X \).

60) A single die is tossed five times. Find the probability that either a one or a two appears exactly four times.

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

61) A five-number summary for a box plot includes which of the following?  
   A) min, \( Q_1 \), \( Q_2 \), \( Q_3 \), max  
   B) min, median, max, average, frequency total  
   C) \( Q_1 \), \( Q_2 \), \( Q_3 \), \( Q_4 \), average  
   D) \( Q_1 \), \( Q_2 \), \( Q_3 \), \( Q_4 \), total
62) Two college students challenge themselves to a contest. A coin is flipped 100 times. The first student thinks (with a better than 50-50 chance) that he can guess 65 or more of the flips before they are flipped. The second student says this is almost impossible. Who is right and why?

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

63) The median of the numbers greater than the median of a set of data is called
   A) the true median.
   B) the third quartile.
   C) the second quartile.
   D) the high median.
   E) none of the above

64) The approximate measure of the angle that represents 50 out of 100 responses in a pie chart is
   A) 216°.
   B) 180°.
   C) 144°.
   D) 50°.

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Solve the problem.

65) Find the variance of

<table>
<thead>
<tr>
<th>k</th>
<th>Pr(X=k)</th>
</tr>
</thead>
<tbody>
<tr>
<td>-1</td>
<td>0.2</td>
</tr>
<tr>
<td>0</td>
<td>0.3</td>
</tr>
<tr>
<td>1</td>
<td>0.1</td>
</tr>
<tr>
<td>2</td>
<td>0.4</td>
</tr>
</tbody>
</table>

The staff of a clinic knows from literature distributed by a pharmaceutical company that of the patients given a certain drug will have bad side effects. Suppose that the clinic gives 294 patients this drug. Use an approximating normal curve to estimate the probability that at least 30 will have bad side effects.

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

67) Find the median of the numbers: 35 38 29 42 45
   A) 38
   B) 29.5
   C) 42
   D) 29

68) If is a normal random variable with mean 12 and standard deviation , an -value of 14 corresponds to

   a standard value of
   A) 2.5.
   B) 5.5.
   C) 0.8.
   D) 1.6.
   E) none of the above

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Solve the problem.

69) Specify , , , and for the following annuity.

$36,029.38 is deposited into an account paying 6% interest compounded monthly. At the end of each month, $400 is withdrawn from the account for 10 years.
Express percents as decimals. Round dollar amounts to the nearest cent.

70) What is the compound amount after three years of $5000 deposited at 8% interest compounded quarterly?

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

71) In order to have $5000 in two years, how much would a person have to invest if the money will earn 24% interest compounded quarterly?
   A) $3137.06
   B) $2969.24
   C) $3177.59
   D) $3108.61
   E) none of the above

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Express percents as decimals. Round dollar amounts to the nearest cent.

72) What is the compound amount after ten years of $5000 deposited at 8% interest compounded quarterly?

Solve the problem.

73) Specify i, n, R, and F for the following annuity.
   At the end of each quarter, $100 is deposited into an account paying 4% interest compounded quarterly. The balance after five years will be $2201.90.

Express percents as decimals. Round dollar amounts to the nearest cent.

74) Calculate the amount after four years if $3000 is deposited at 6% simple interest.

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

75) The APR for a 30-year, $250,000 mortgage at 6% interest compounded monthly and two discount points is
   A) 6.19%.
   B) 6.25%.
   C) 6.12%.
   D) 5.87%.

76) How much money must you deposit now at 6% interest compounded quarterly in order to be able to withdraw $6000 at the end of each quarter for five years?
   A) $68,819.53
   B) $103,011.83
   C) $138,742.00
   D) $154,517.75
   E) none of the above

77) Calculate the effective rate for 4.4% interest compounded monthly. Round to the nearest hundredth of a percent.
   A) 4.6%
   B) 4.30%
   C) 4.1%
   D) 4.49%
   E) none of the above

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Express percents as decimals. Round dollar amounts to the nearest cent.

78) What is the compound amount after three years of $5000 deposited at 6.5% interest compounded weekly?
MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

79) If you deposit $2000 into a fund paying 18% interest compounded monthly, how much can you withdraw at the end of each month for one year?
   A) $170.48
   B) $153.36
   C) $183.36
   D) $189.12
   E) none of the above

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Express percents as decimals. Round dollar amounts to the nearest cent.

80) Which would be the better investment: 9% interest compounded annually or 8.7% compounded daily?
   80) ____________________

Solve the problem.

81) True or False: The longer a loan with up-front fees is held, the greater the effective mortgage rate.
   81) ____________________

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

82) How much money can you borrow at 12% interest compounded monthly if you agree to pay $200 at the end of each month for three years and, in addition, a balloon payment of $2000 at the end of the third year?
   A) $8021.50
   B) $1377.85
   C) $7796.40
   D) $7419.35
   E) none of the above

83) A mortgage at 18% interest compounded monthly with a monthly payment of $500 has an unpaid balance of $5035.56 after 109 months. Find the unpaid balance after 110 months.
   A) $4611.09
   B) $4575
   C) $425
   D) $4550
   E) none of the above

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Solve the problem.

84) A loan of $10,000 is to be repaid with monthly payments for five years at 6% interest compounded monthly. Calculate the monthly payment
   84) ____________________

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

85) Find the present value of $5000 payable in three years at 16% simple interest.
   A) $7400
   B) $3203.29
   C) $3378.38
   D) $4310.34
   E) none of the above
86) Is it more profitable to receive $2000 at the end of each month for 5 years or to receive a lump sum of $180,000 at the end of 5 years? Assume money can earn 18% interest compounded monthly.
   A) $2000 at the end of each month for 5 years     B) $180,000 at the end of 5 years

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Solve the problem.
87) A loan of $8000 is to be repaid with monthly payments for five years at 12% interest compounded monthly. Calculate the monthly payments.

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.
88) Calculate the effective rate for 20% interest compounded semiannually.
   A) 21.5%
   B) 20%
   C) 21%
   D) 20.5%
   E) none of the above

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Solve the problem.
89) Suppose a loan has an interest rate of 12% compounded monthly for eight months. Given that the monthly payment is $220, calculate the unpaid balance after five months.

90) Calculate the future value of an annuity of $200 per month for five years at 12% interest compounded monthly.

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.
91) What is the present value of $2000 payable in five years at 6% interest compounded annually?
   A) $1488.19
   B) $1584.19
   C) $1775.94
   D) $1494.52
   E) none of the above

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Express percents as decimals. Round dollar amounts to the nearest cent.
92) Calculate the compound amount after four years if $3000 is deposited at 6% interest compounded monthly.

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.
93) Is it more profitable to receive $20,000 now or $50,000 in 10 years? Assume that money can earn 10% interest compounded semiannually.
   A) $20,000 now     B) $50,000 in 10 years
Answer Key
Testname: 131-PRACTICEFINAL

1) \( \left( \frac{13}{8}, \frac{9}{8} \right) \)

2) (a)

(b) \( A = ((0, 20), B = (18, 10), C = (20, 0), D = (5, 0), E = (0, 5) \)

3)

4) (-1, -8)

5) (a)

(b) \( A = (4, 0), B = (0, 3), C = (4, 0), D = (0, 0) \)

6) \( y = \frac{2}{3}x \)

7) \( y = -3x + 5 \)

8) 0.75

9) C

10) \( y = -4x + 11 \)
11) (a) 15
(b) No, anywhere along the line segment connecting (3, 3) to (5, 0).
12) (a) 
(b) 
A = (0, 9), B = (6, 6), C = (2, 2), D = (0, 2)
(b) The maximum is 45 and occurs at (0, 9).
13) B
14) D
15) (a) \(x\) = the number of tee shirts shipped from Oakland to Berkeley
     \(y\) = the number of tee shirts shipped from Oakland to San Jose
(b) 
\[
\begin{align*}
    x + y &\leq 9000 \\
    3000 &\leq x + y \\
    4000 &\geq x, \\
    7000 &\geq y \\
    x &\geq 0, \\
    y &\geq 0
\end{align*}
\]
(c) shipping costs = 2\(x\) + 3\(y\) + 96,000
16) Yes; \(x = 8, y = 3\), satisfies all the second inequalities.
17) D
18) No; \(x = 1, y = 2\), does not satisfy the second inequality.
19) E
20) Yes; \(x = 3, y = 7\), satisfies all four inequalities.
21) C
22) 4 + 5 + 6 + 7 > 20
23) \{\emptyset\}
24) 3432777
25) 
26) C
27) 6
28) \(\binom{9}{5} = 126\)
29) B
30) (a) \(\binom{10}{4} = 210\)
     (b) \(\binom{6}{3} \cdot \binom{4}{1} = 80\)
     (c) \(\binom{6}{4} = 15\)
31) 27
32) \(\binom{8}{4} \cdot \binom{5}{4} = 350\)
33) 

34) (9)
35) (a) \(28 = 256\)  
   (b) \(C(8, 2) = 28\)  
   (c) \(256 - 9 = 247\)
36) \(\frac{73}{135}\)
37) C
38) 
   \(\begin{array}{c}
   10 \\
   2 \\
   \end{array}\) = \(\begin{array}{c}
   15 \\
   128 \\
   \end{array}\)
39) B
40) A
41) A
42) A
43) C
44) .679
45) 0.18
46) 
   \(\begin{array}{c}
   10 \\
   8 \\
   \end{array}\) + \(\begin{array}{c}
   10 \\
   9 \\
   \end{array}\) + \(\begin{array}{c}
   10 \\
   10 \\
   \end{array}\) = \(\frac{7}{128}\) \(\approx\) 0.055
47) The game ends if the score is 6 or 9. The number of different ways for getting a 6 is 5 and the number of different ways for getting a 9 is 4.  
   (a) \(\frac{5}{9}\)  
   (b) \(\frac{4}{9}\)
48) \(6\) \(\left(\frac{1}{4}\right)^5 \left(\frac{3}{4}\right)^2 = \frac{135}{4096}\)
49) \(\begin{array}{c}
   3 \\
   1 \\
   \end{array}\) \(\begin{array}{c}
   2 \\
   1 \\
   \end{array}\) \(\begin{array}{c}
   4 \\
   2 \\
   \end{array}\) = \(\frac{2}{7}\)
50) 0.9
51) 0
52) B
53) (a) 
<table>
<thead>
<tr>
<th>No. accidents</th>
<th>Rel. freq</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.175</td>
</tr>
<tr>
<td>1</td>
<td>0.300</td>
</tr>
<tr>
<td>2</td>
<td>0.175</td>
</tr>
<tr>
<td>3</td>
<td>0.200</td>
</tr>
<tr>
<td>4</td>
<td>0.100</td>
</tr>
<tr>
<td>5</td>
<td>0.050</td>
</tr>
<tr>
<td>--------------</td>
<td>----------</td>
</tr>
</tbody>
</table>
   (b) 5
   (c) 1
54) A
Answer Key
Testname: 131-PRACTICEFINAL

55) $k \quad \Pr(Y = k)$

<table>
<thead>
<tr>
<th>$k$</th>
<th>( \frac{1}{16} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>( \frac{1}{4} )</td>
</tr>
<tr>
<td>2</td>
<td>( \frac{3}{8} )</td>
</tr>
<tr>
<td>3</td>
<td>( \frac{1}{4} )</td>
</tr>
<tr>
<td>4</td>
<td>( \frac{1}{16} )</td>
</tr>
</tbody>
</table>

56) D
57) yes
58)

<table>
<thead>
<tr>
<th>$k$</th>
<th>( \Pr(Y = k) )</th>
</tr>
</thead>
<tbody>
<tr>
<td>$5000$</td>
<td>( \frac{1}{15} )</td>
</tr>
<tr>
<td>$1000$</td>
<td>( \frac{8}{15} )</td>
</tr>
<tr>
<td>$0$</td>
<td>( \frac{6}{15} )</td>
</tr>
</tbody>
</table>

59) (a) 10
     (b) 9.9
60) \( \frac{10}{243} \)

61) A
62) The second student. The probability of this occurring is approximately .006.
63) B
64) B
65) 1.41
66) approximately \( \approx 0.9812 \)
67) A
68) D

69) \( i = \frac{1}{2} \% = 0.005, \ n = 120, \ R = 400, \ P = 36,029.38 \)

70) $6341.21$
71) A
72) $11,040.20$
73) \( i = 0.01, \ n = 20, \ R = 100, \ F = 2201.90 \)
74) $3720.00$
75) A
76) B
77) D
78) $6075.82$
79) C

80) 8.7% compounded daily has an effective rate of approximately 9.09% and is the better investment
81) False. Although the effective rate is higher than the APR, the longer time the loan is held the more the costs are spread over the life of the loan.
82) D
83) A
84) $193.33$
85) C
Answer Key
Testname: 131-PRACTICEFINAL

86) A
87) $177.96
88) C
89) $647.02
90) $16,333.93
91) D
92) $3811.47
93) A