

Determine the process needed to correctly complete each item on the review. **DO WRITE and make notes on YOUR review!** Check with me when you have questions about specific items.

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

Decide whether the argument is an example of inductive or deductive reasoning.

- 1) Practice makes perfect. I have practiced. Therefore, I'll be perfect.
- 2) $31 + 31 = 62$, $23 + 3 = 26$, $37 + 11 = 48$. Therefore, the sum of two prime numbers is even.

Find a pattern and use it to solve the problem.

- 3) Find the next term: 25, 4, 21, 6, 15, 8
- 4) Find the next term: 1, 1, 2, 3, 5, 8, 13

Use the method of successive differences to determine the next term in the sequence.

- 5) 5, 11, 49, 119, 221, . . .
- 6) 3, 26, 103, 278, 617, 1208, . . .

Solve the problem.

- 7) Sally and Karl work at different jobs. Sally earns \$6 per hour and Karl earns \$3 per hour. They each earn the same amount per week but Karl works 4 more hours. How many hours a week does Karl work?

Rate times Base equals Amount ($r * b = A$). Which of the three, r , b , or A , is the same for both Sally and Karl?

- 8) Missy and Bill work at different jobs. Missy earns \$7 per hour and Bill earns \$5 per hour. They each earn the same amount per week but Bill works 2 more hours. How many hours a week does Bill work?

Find the number of subsets of the set.

- 9) $\{x \mid x \text{ is an even number between } 19 \text{ and } 31\}$
- 10) $\{\text{math, English, history, science, art}\}$

The lists below show five agricultural crops in Alabama, Arkansas, and Louisiana.

<u>Alabama</u>	<u>Arkansas</u>	<u>Louisiana</u>
soybeans (s)	soybeans (s)	soybeans (s)
peanuts (p)	rice (r)	sugarcane (n)
corn (c)	cotton (t)	rice (r)
hay (h)	hay (h)	corn (c)
wheat (w)	wheat (w)	cotton (t)

Let U be the smallest possible universal set that includes all of the crops listed, and let A , K and L be the sets of five crops in Alabama, Arkansas, and Louisiana, respectively. Find each of the following sets.

11) The set of crops common to A , K , and L

List the elements in the set .

Let $U = \{q, r, s, t, u, v, w, x, y, z\}$

$A = \{q, s, u, w, y\}$

$B = \{q, s, y, z\}$

$C = \{v, w, x, y, z\}$.

12) $A \cup C$

13) $B \cap C$

14) $(A \cup B)'$

15) $A' \cup B$

The lists below show five agricultural crops in Alabama, Arkansas, and Louisiana.

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hay (h)	hay (h)	corn (c)
wheat (w)	wheat (w)	cotton (t)

Let U be the smallest possible universal set that includes all of the crops listed, and let A , K and L be the sets of five crops in Alabama, Arkansas, and Louisiana, respectively. Find each of the following sets.

16) The set of crops in U .

Find the Cartesian product.

17) $A = \{4, 6, 3\}$

$B = \{2, 6\}$

Find $A \times B$.

18) $A = \{i, a\}$

$B = \{t, d, m\}$

Find $A \times B$.

Write a negation for the statement.

19) Everyone is asleep.

20) Some athletes are musicians.

Construct a truth table for the statement.

21) $\sim r \wedge \sim s$

22) $\sim s \vee (\sim p \vee s)$

Use De Morgan's laws to write the negation of the statement.

23) A day late and a dollar short.

24) Roger or Emil will attend the game.

Construct a truth table for the statement.

25) $q \rightarrow \sim p$

Write the converse, inverse, or contrapositive of the statement as requested.

26) If I were young, I would be happy.

Converse

27) All cats catch birds.

Inverse

28) If I pass, I'll party.

Contrapositive

Solve the problem.

29) At a lumber company, shelves are sold in 3 types of wood, 3 different widths and 6 different lengths. How many different types of shelves could be ordered?

30) A saleswoman packed 3 jackets and 5 skirts. With one jacket, she could wear all 5 skirts. With another jacket, she could wear 4 skirts. With the third jacket, she could wear only 3 skirts. How many different combinations did she have?

31) How many different 4-letter radio-station call letters can be made if the first letter must be K or W, repeats are allowed, but the call letters cannot end in an O?

32) How many ways can a president, vice-president, and secretary be chosen from a club with 11 members?

33) Given a committee of 8 women and 11 men, count the number of different ways of choosing a president, a secretary, and a treasurer, if the president must be a woman and the secretary and treasurer must be men. Assume no one can hold more than one office.

- 34) A pool of possible jurors consists of 13 men and 14 women. How many different juries consisting of 5 men and 7 women are possible?
- 35) A poker hand consists of 5 cards dealt from an ordinary deck of 52 playing cards. How many different hands are there consisting of four cards of one suit and one card of another suit?
- 36) In how many ways could a group of fourteen people be divided into four groups containing respectively two, three, four, and five people?

Find the probability.

- 37) Two fair 6-sided dice are rolled. What is the probability the sum of the two numbers on the dice is 4?
- 38) Two fair 6-sided dice are rolled. What is the probability that the sum of the two numbers on the dice is greater than 10?
- 39) When two balanced dice are rolled, there are 36 possible outcomes. What is the probability that the sum of the numbers on the dice is 6 or 11?

Find the indicated probability.

- 40) A bag contains 7 red marbles, 2 blue marbles, and 1 green marble. If a marble is selected at random, what is the probability that it is not blue?
- 41) A sample of 4 different calculators is randomly selected from a group containing 14 that are defective and 39 that have no defects. What is the probability that at least one of the 4 calculators in the sample is defective?
- 42) The following table contains data from a study of two airlines which fly to Small Town, USA.

	Number of flights which were on time	Number of flights which were late
Podunk Airlines	33	6
Upstate Airlines	43	5

If one of the 87 flights is randomly selected, find the probability that the flight selected is an Upstate Airlines flight given that it was late.

- 43) The table below shows the soft drinks preferences of people in three age groups.

	cola	root beer	lemon-lime
under 21 years of age	40	25	20
between 21 and 40	35	20	30
over 40 years of age	20	30	35

If one of the 255 subjects is randomly selected, find the probability that the person drinks root beer given that they are over 40.

44) The table below describes the smoking habits of a group of asthma sufferers.

		Light	Heavy	
	Nonsmoker	smoker	smoker	Total
Men	307	70	83	460
Women	326	83	77	486
Total	633	153	160	946

If one of the 946 subjects is randomly selected, find the probability that the person chosen is a nonsmoker given that the person is a woman.

Solve the problem.

45) The table shows the number of college students who prefer a given pizza topping.

toppings	freshman	sophomore	junior	senior
cheese	13	12	19	23
meat	21	23	12	13
veggie	12	13	21	23

Find the empirical probability that a randomly selected junior prefers meat toppings.

Find the probability.

46) In one town, 78% of adults have health insurance. What is the probability that 8 adults selected at random from the town all have health insurance?

47) In one town, 33% of all voters are Democrats. If two voters are randomly selected for a survey, find the probability that they are both Democrats.

Use the general multiplication rule to find the indicated probability.

48) A sample of 4 different calculators is randomly selected from a group containing 48 that are defective and 20 that have no defects. What is the probability that all four of the calculators selected are defective?

49) Two cards are selected without replacement from a standard deck of 52 cards. What is the probability that both cards are the same color (i.e., either both black or both red)?

50) Two marbles are drawn without replacement from a box with 3 white, 2 green, 2 red, and 1 blue marble. Find the probability that both marbles are white.

Find the indicated probability.

51) A sample of 4 different calculators is randomly selected from a group containing 19 that are defective and 36 that have no defects. What is the probability that at least one of the 4 calculators in the sample is defective?

52) The distribution of B.A. degrees conferred by a local college is listed below, by major.

<u>Major</u>	<u>Frequency</u>
English	2073
Mathematics	2164
Chemistry	318
Physics	856
Liberal Arts	1358
Business	1676
Engineering	<u>868</u>
	9313

What is the probability that a randomly selected degree is not in Liberal Arts?

Construct a stem and leaf display for given data.

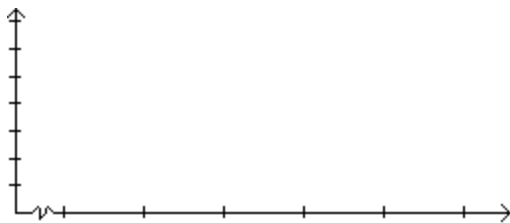
53) Here are the final scores for the last 16 games played by the local basketball team.

45 54 53 65
 67 75 57 59
 87 86 79 74
 67 75 87 65

Construct the specified histogram.

54) In a survey, 20 voters were asked their age. The results are summarized in the frequency table below. Construct a histogram .

Age of voters	Number of voters
20-29	5
30-39	5
40-49	6
50-59	0
60-69	4



Find the mean of the set of data.

55) 226, 221, 213, 213, 213, 213, 221, 214, 214, 214, 221, 221
 Round your answer to one decimal place.

Find the median.

56) 1, 9, 26, 25, 33, 38

Find the mean for the given frequency distribution.

57)

Value	Frequency
12	2
17	12
22	20
31	13
33	10

Find the median for the given frequency distribution.

58)

Value	Frequency
0	8
1	12
2	15
3	20
4	20
5	14

Solve the problem.

- 59) To get a C in history, Nandan must average 71 on four tests. Scores on the first three tests were 65, 77, and 63. What is the lowest score that Nandan can get on the last test and still receive a C?
- 60) Jackie's sisters weigh 117 lb, 148 lb, 128 lb, and 125 lb. The average female in her city weighs 139.1 lb. How much does Jackie weigh if she and her sisters have an average weight of 139.1 lb?
- 61) Which score has the better relative position: a score of 52 on a test for which the mean is 43 and the standard deviation is 10, a score of 3.3 on a test for which the mean is 2.6 and the standard deviation is 0.7 or a score of 356.2 on a test for which the mean is 337 and the standard deviation is 48?
- 62) A radio station claims that the amount of advertising per hour of broadcast time has an average of 16 minutes and a standard deviation equal to 2.6 minutes. You listen to the radio station for 1 hour, at a randomly selected time, and carefully observe that the amount of advertising time is equal to 10 minutes. Calculate the z-score for this amount of advertising time.

63) Elizabeth and Angela skate for their college speed-skating team. In the last race, Elizabeth skated the 500-meter race in 61 seconds. The average for this race is 65 seconds with a standard deviation of 4.0 seconds. Angela skated the 1000-meter race in 135 seconds. The average for this race is 140 seconds with a standard deviation of 10.0 seconds. Find the z-score for each skater. Relatively speaking, which skater had the faster time?

64) Martin scored 41 points on a quiz. The average score for his class was 39 with a standard deviation of 2.4. Martin's brother Jeff who is in a different class also had a quiz. He scored 30. The average score in Jeff's class was 26 with a standard deviation of 1.9. Find the z-score for each person. Relatively speaking, who did better?

Find the simple interest. The rate is an annual rate unless otherwise noted. Assume 365 days in a year and 30 days per month.

65) \$1180 at 5% for 1 months

66) \$2020 at 4% for 4 years

Find the future value of the deposit if the account pays simple interest.

67) \$990 at 3.3% for 4 years

Solve the problem. Assume that simple interest is being calculated in each case. Round the answer to the nearest cent unless otherwise indicated.

68) Allan borrowed \$4400 from his father to buy a car. He repaid him after 7 months with interest of 7% per year. Find the total amount he repaid.

69) Martin takes out a simple interest loan at 2.5 %. After 9 months the amount of interest on the loan is \$29.42. What was the amount of the loan? Round to the nearest dollar.

Find the compound interest earned by the deposit. Round to the nearest cent.

70) \$5000 at 1% compounded quarterly for 1 year

Solve the problem.

71) The cash price of a dinette set is \$220. The customer paid \$45 as a down payment. The remainder will be paid in 18 monthly installments of \$11.00 each. Find the amount of the finance charge.

72) The cash price of a fitness system is \$809.99. The customer paid \$115 as a down payment. The remainder will be paid in 36 monthly installments of \$24.44 each. Find the amount of the finance charge.

73) The monthly payment on a(n) \$56,000 loan at 4.0% annual interest is \$295.59. How much of the first monthly payment will go toward the principal?

74) The monthly payment on a(n) \$88,000 loan at 3.5% annual interest is \$508.60. How much of the first monthly payment will go toward interest?

Solve the problem. If necessary, use the table of monthly payments below. Round your answer to the nearest cent.

Monthly Payments to Repay Principal and Interest on a \$1000 Mortgage

Annual Rate (r)	Term of Mortgage (Years)					
	5	10	15	20	25	30
8.0%	\$20.27639	\$12.13276	\$9.55652	\$8.36440	\$7.71816	\$7.33765
8.5%	20.51653	12.39857	9.84740	8.67823	8.05227	7.68913
9.0%	20.75836	12.66758	10.14267	8.99726	8.39196	8.04623
9.5%	21.00186	12.93976	10.44225	9.32131	8.73697	8.40854
10.0%	21.24704	13.21507	10.74605	9.65022	9.08701	8.77572
10.5%	21.49390	13.49350	11.05399	9.98380	9.44182	9.14739
11.0%	21.74242	13.77500	11.36597	10.32188	9.80113	9.52323
11.5%	21.99261	14.05954	11.68190	10.66430	10.16469	9.90291
12.0%	22.24445	14.34709	12.00168	11.01086	10.53224	10.28613

75) Find the monthly payment needed to amortize principal and interest for the following fixed-rate mortgage.

Mortgage amount: \$106,500

Term of mortgage: 25 years

Interest rate: 10%

76) Find the monthly payment needed to amortize principal and interest for the following fixed-rate mortgage.

Mortgage amount: \$135,200

Term of mortgage: 30 years

Interest rate: 9.5%

Solve the problem.

77) For the given stock investment, find the total purchase price:

Number of Shares	Purchase Price Per Share	Dividend Per Share	Sale Price Per Share
110	\$23	\$3	\$44

78) For the given stock investment, find the total dividend amount:

Number of Shares	Purchase Price Per Share	Dividend Per Share	Sale Price Per Share
200	\$22	\$1	\$42

79) For the given stock investment, find the capital gain:

Number of Shares	Purchase Price Per Share	Dividend Per Share	Sale Price Per Share
180	\$21	\$1	\$40

Answer Key

Testname: 1010 REV EXTRA

- 1) Deductive
- 2) Inductive
- 3) 7
- 4) 21
- 5) 355
- 6) 2161
- 7) 8
- 8) 7
- 9) 64
- 10) 32
- 11) {s}
- 12) {q, s, u, v, w, x, y, z}
- 13) {y, z}
- 14) {r, t, v, x}
- 15) {q, r, s, t, v, x, y, z}
- 16) {c, h, n, p, r, s, t, w}
- 17) {(4, 2), (4, 6), (6, 2), (6, 6), (3, 2), (3, 6)}
- 18) {(i, t), (i, d), (i, m), (a, t), (a, d), (a, m)}
- 19) Not everyone is asleep.
- 20) No athlete is a musician.
- 21)

r	s	$(\sim r \wedge \sim s)$
T	T	F
T	F	F
F	T	F
F	F	T
- 22)

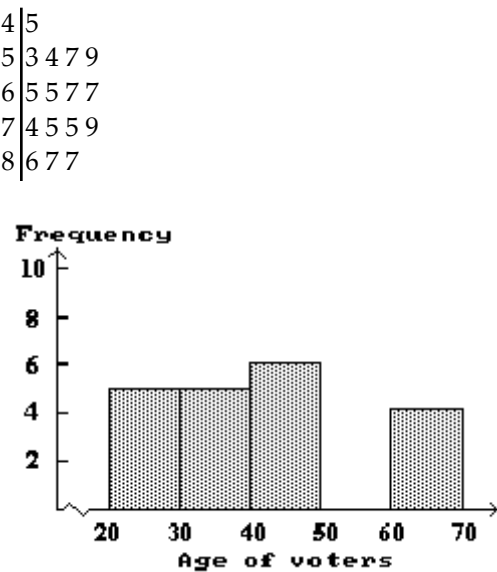
s	p	$\sim s \vee (\sim p \vee s)$
T	T	T
T	F	T
F	T	T
F	F	T
- 23) Not a day late or not a dollar short.
- 24) Roger will not attend the game and Emil will not attend the game.
- 25)

q	p	$q \rightarrow \sim p$
T	T	F
T	F	T
F	T	T
F	F	T
- 26) If I were happy, I would be young.
- 27) If it's not a cat, it doesn't catch birds.
- 28) If I don't party, I didn't pass.
- 29) 54
- 30) 12
- 31) 33,800
- 32) 990
- 33) 880
- 34) 4,416,984
- 35) 111,540

- 36) 2,522,520
- 37) $\frac{1}{12}$
- 38) $\frac{1}{12}$
- 39) $\frac{7}{36}$
- 40) $\frac{4}{5}$
- 41) 0.719
- 42) $\frac{5}{11}$
- 43) $\frac{6}{17}$
- 44) 0.671
- 45) 0.231
- 46) 0.137
- 47) 0.109
- 48) 0.2389
- 49) 0.490
- 50) $\frac{3}{28}$
- 51) 0.827
- 52) 0.768
- 53)

4	5
5	3 4 7 9
6	5 5 7 7
7	4 5 5 9
8	6 7 7
- 54)

20	30	40	50	60	70
Age of voters					
- 55) 217.0
- 56) 25.5
- 57) 24.6
- 58) 3



Answer Key

Testname: 1010 REV EXTRA

- 59) 79
- 60) 177.5 lb
- 61) A score of 3.3
- 62) -2.31
- 63) -1.0, -0.5, Elizabeth
- 64) 0.83, 2.11, Jeff
- 65) \$4.92
- 66) \$323.20
- 67) \$1120.68
- 68) \$4579.67
- 69) \$1569
- 70) \$50.19
- 71) \$23.00
- 72) \$184.85
- 73) \$108.92
- 74) \$256.67
- 75) \$967.766565
- 76) \$1136.83
- 77) \$2530
- 78) \$200
- 79) \$3420