Exam

Name_____

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

Find a counterexample to show that the statement is false.
    1) No women have sat on the bench of the U.S. Supreme Court.   1) _____

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

    2) If a number is multiplied by itself, the result is greater than 0.   2) _____
        A) The number is $\frac{1}{2}$.   B) The number is 1.

        C) The number is 0.   D) The number is 0.1.

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

    3) All U.S. presidents have been one-term presidents.   3) _____

    4) All actors are Academy Award winners.   4) _____

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

Identify a pattern in the list of numbers. Then use this pattern to find the next number.
    5) 3, 8, 13, 18, 23, ___   5) _____
        A) 27   B) 26   C) 28   D) 33

    6) 1, 18, 1, 27, 1, 36, 1, _____   6) _____
        A) 54   B) 47   C) 1   D) 45

    7) 40, 33, 26, 19, 12   7) _____
        A) 7   B) 0   C) 2   D) 5

    8) 4, -8, 16, -32, 64   8) _____
        A) -96   B) 96   C) 128   D) -128

    9) 1, $-\frac{1}{3}, \frac{1}{9}, -\frac{1}{27}, \frac{1}{81}$ 9) _____
        A) 1/243   B) -1/243   C) -1/729   D) 1/729

    10) 1, 2, 2, 4, 4, 8   10) _____
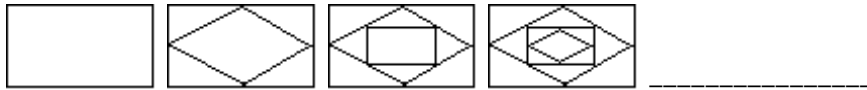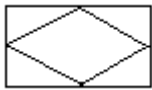   A) 6   B) 12   C) 8   D) 16

1

Identify a pattern in the sequence of figures. Then use the pattern to find the next figure in the sequence.
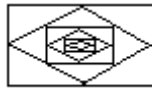
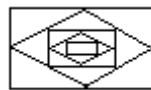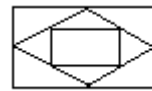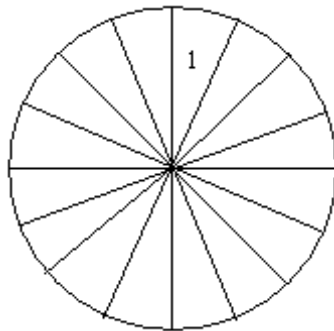11)   11) _____

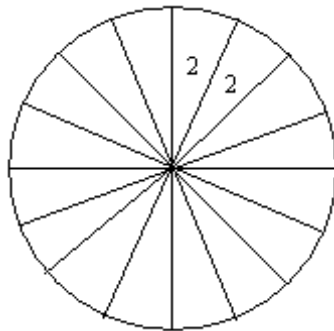A)   B)   C)   D)
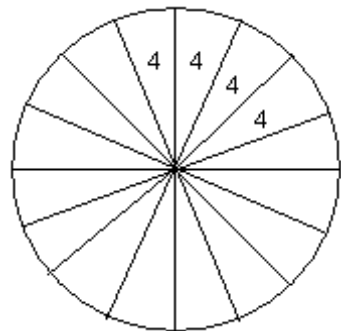

12)   12) _____

A)   B)

C)   D)
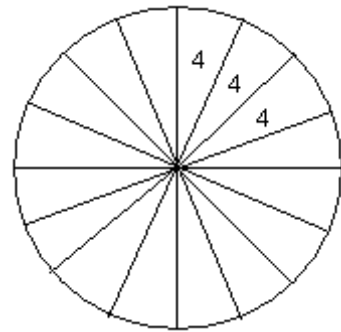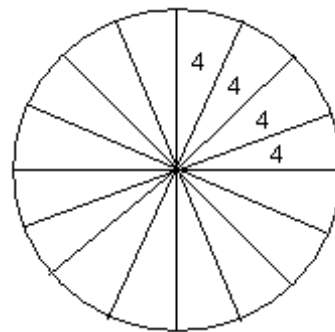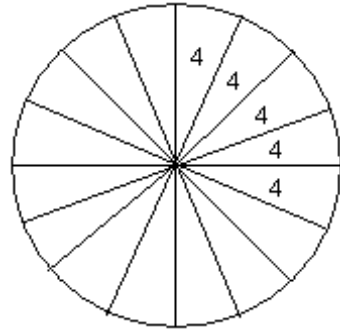
The problem describes procedures that are to be applied to numbers. Repeat the procedure for four numbers of your choice. Write a conjecture that relates the result of the process to the original number selected.

13) Select a number. Multiply the number by 16. Add 16 to the product. Divide this sum by 8. Subtract 2 from the quotient.   13) _____
    A) The result is the original number.
    B) The result is double the original number.
    C) The result is one more than the original number.
    D) The result is one more than double the original number.

Use inductive reasoning to predict the next line in the pattern. Then perform the arithmetic to determine whether your conjecture is correct.

14) $20 - 9 = 11$ 14) _____
    $200 - 89 = 111$
    $2000 - 789 = 1211$

    A) $2000 - 6,789 = 13,211$ B) $20,000 - 6,789 = 13,211$
    C) $20,000 - 6,789 = 193,211$ D) $200,000 - 6,789 = 13,211$

15) $76 - 74 + 72 - 70 = 77 - 75 + 73 - 71$ 15) _____
    $86 - 84 + 82 - 80 = 87 - 85 + 83 - 81$

    A) $96 + 94 - 92 - 90 = 97 + 95 - 93 + 91$ B) $96 - 94 + 92 - 90 = 97 - 95 + 93 - 91$
    C) $96 + 94 - 92 + 90 = 97 + 95 - 93 + 91$ D) $96 - 94 - 92 + 90 = 97 - 95 + 93 - 91$

16) $4 \times 6 = 5 \times 7 - 11$ 16) _____
    $6 \times 8 = 7 \times 9 - 15$

    A) $8 \times 10 = 9 \times 11 - 17$ B) $8 \times 10 = 11 \times 15 - 19$
    C) $8 \times 10 = 9 \times 11 + 17$ D) $8 \times 10 = 9 \times 11 - 19$

17) $6 \times 6 = 36$ 17) _____
    $66 \times 66 = 4356$
    $666 \times 666 = 443,556$

    A) $6666 \times 6666 = 445,556$ B) $6666 \times 6666 = 44,435,556$
    C) $666 \times 6666 = 44,435,556$ D) $6666 \times 6666 = 444,556$

18) $8 \times 9 = 10 \times 11 - (8 + 9 + 10 + 11)$ 18) _____
    $9 \times 10 = 11 \times 12 - (9 + 10 + 11 + 12)$

    A) $11 \times 12 = 13 \times 14 - (11 + 12 + 13 + 14)$
    B) $11 \times 12 = 13 \times 14 - (10 + 9 + 8 + 7)$
    C) $10 \times 11 = 12 \times 13 - (10 + 11 + 12 + 13)$
    D) $10 \times 11 = 12 \times 13 - (8 + 9 + 10 + 11 + 12 + 13)$

19) $(1 \times 9) - 4 = 5$ 19) _____
    $(21 \times 9) - 4 = 185$
    $(321 \times 9) - 4 = 2885$

    A) $(4321 \times 9) - 4 = 3884$ B) $(4321 \times 9) - 4 = 38,885$
    C) $(4321 \times 9) - 4 = 28,885$ D) $(432 \times 9) - 4 = 38,885$

20) $(6 \times 1) \times (2 \times 1) = 12$
$(6 \times 10) \times (2 \times 2) = 240$
$(6 \times 100) \times (2 \times 3) = 3600$

    A) $(6 \times 1000) \times (2 \times 4) = 48{,}000$ B) $(6 \times 1000) \times (2 \times 4) = 54{,}000$
    C) $(6 \times 1000) \times (2 \times 4) = 42{,}000$ D) $(6 \times 1000) \times (2 \times 4) = 4800$

20) _____

21) $37{,}037 \times 3 = 111{,}111$
$37{,}037 \times 6 = 222{,}222$
$37{,}037 \times 9 = 333{,}333$
$37{,}037 \times 12 = 444{,}444$

    A) $37{,}037 \times 18 = 666{,}666$ B) $111{,}111 \times 15 = 1{,}666{,}665$
    C) $37{,}037 \times 13 = 481{,}481$ D) $37{,}037 \times 15 = 555{,}555$

21) _____

22)

$$\frac{1}{3} = \frac{1}{2}\left(1 - \frac{1}{3}\right)$$

$$\frac{1}{3} + \frac{1}{9} = \frac{1}{2}\left(1 - \frac{1}{9}\right)$$

$$\frac{1}{3} + \frac{1}{9} + \frac{1}{27} = \frac{1}{2}\left(1 - \frac{1}{27}\right)$$

$$\frac{1}{3} + \frac{1}{9} + \frac{1}{27} + \frac{1}{81} = \frac{1}{2}\left(1 - \frac{1}{81}\right)$$

A) $\frac{1}{3} + \frac{1}{9} + \frac{1}{27} + \frac{1}{81} + \frac{1}{162} = \frac{1}{2}\left(1 - \frac{1}{162}\right)$ B) $\frac{1}{3} + \frac{1}{9} + \frac{1}{27} + \frac{1}{81} + \frac{1}{243} = \frac{1}{3}\left(1 - \frac{1}{243}\right)$

C) $\frac{1}{3} + \frac{1}{9} + \frac{1}{27} + \frac{1}{81} + \frac{1}{243} = \frac{1}{2}\left(1 - \frac{1}{243}\right)$ D) $\frac{1}{3} + \frac{1}{9} + \frac{1}{27} + \frac{1}{81} + \frac{1}{729} = \frac{1}{2}\left(1 - \frac{1}{729}\right)$

22) _____

23) $8(5) = 10(5 - 1)$
$8(5) + 8(25) = 10(25 - 1)$
$8(5) + 8(25) + 8(125) = 10(125 - 1)$
$8(5) + 8(25) + 8(125) + 8(625) = 10(625 - 1)$

    A) $8(5) + 8(25) + 8(125) + 8(625) + 8(3125) = 8(3125 - 1)$
    B) $8(5) + 8(25) + 8(125) + 8(625) + 8(3125) = 10(3125 - 1)$
    C) $8(5) + 8(25) + 8(125) + 8(625) + 8(5000) = 10(5000 - 1)$
    D) $8(5) + 8(25) + 8(125) + 8(625) + 8(1250) = 10(1250 - 1)$

23) _____

The following table relates an adult's body weight, in pounds, to his or her dosage of a certain medication, in milligrams.

24)

Weight	100	125	150	175	200	225
Dosage	50	57	64			

a. Use inductive reasoning to fill in the missing portions of the table.
b. What would be the dosage of a person who weighs 375 pounds?

A) a.

Weight	100	125	150	175	200	225
Dosage	50	57	64	71	78	85

b. 127 mg

B) a.

Weight	100	125	150	175	200	225
Dosage	50	57	64	71	221	271

b. 134 mg

C) a.

Weight	100	125	150	175	200	225
Dosage	50	57	64	71	71	71

b. 113 mg

D) a.

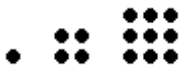| Weight	100	125	150	175	200	225
Dosage	50	57	64	71	75	76

b. 120 mg

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

Solve the problem using inductive reasoning.

25) Write the next three "square" figurate numbers.

26) Write the next three "triangular" figurate numbers.

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

Which reasoning process is shown in the following example?

27) We examine the email addresses of 100 people. No two individuals from this group of people have identical email addresses. We conclude that for all people, no two people have identical email addresses.

A) inductive reasoning
B) reasoning by counterexample
C) theoretical reasoning
D) deductive reasoning

28) If Mary goes to the mall, she gets ice cream. Mary did not get ice cream. We conclude Mary did not go to the mall.   28) _____
    A) reasoning by counterexample   B) deductive reasoning
    C) theoretical reasoning   D) inductive reasoning

The problem describes procedures that are to be applied to numbers. Represent the original number as n and use deductive reasoning to prove a conjecture that relates the result of the process to the number n.

29) Select a number. Multiply the number by 88. Add 88 to the product. Divide this sum by 44. Subtract two from the quotient.   29) _____

A) $\dfrac{88n + 88}{44} - 2 = 2n + 2 - 2 = 2n$
        B) $\dfrac{88n + 88}{88} - 1 = n + 1 - 1 = n$

C) $\dfrac{88n + 88}{88} - 2 = n + 1 - 2 = n - 1$
        D) $\dfrac{88n + 44}{44} - 2 = 2n + 1 - 2 = 2n - 1$

Solve the problem.

30) Study the pattern, or trend, shown by the data. Then select the expression that best describes the number of tickets sold, in thousands, n years after Year 1.   30) _____

Game Attendence: Number of Highschool Football Tickets Sold
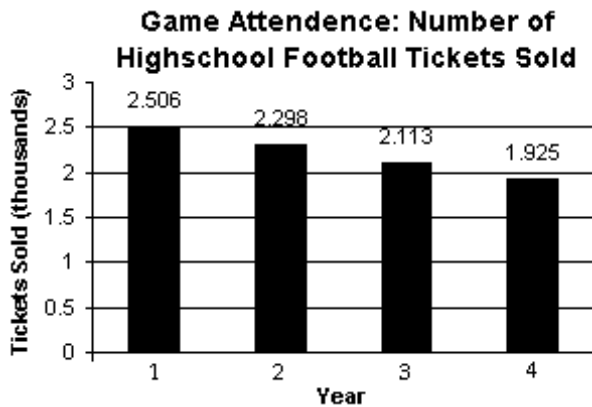
    A) 2.5 + 1.02n   B) 2.5 - 1.02n   C) 2.5 + 0.2n   D) 2.5 - 0.2n

Round the number to the given place value.

31) In the past year, a company spent $793,749,766 on advertising. Round the advertising figure to the nearest hundred thousand.   31) _____
    A) $793,800,000   B) $700,000,000   C) $793,700,000   D) $800,000,000

32) A publishing company sold 37,265,591 books last year. Round the number of books sold to the nearest ten million.   32) _____
    A) 40,000,000   B) 37,000,000   C) 30,000,000   D) 37,270,000

33) In a town in California, the average consumption of soft drinks per day per elementary school student is 15.385 ounces. Round this value to the nearest tenth.   33) _____
    A) 16 ounces   B) 15.5 ounces   C) 15.4 ounces   D) 15.3 ounces

34) According to his ultra-precise scale, Paul gained 3.637 pounds in a three-month period. Round this amount to the nearest hundredth.   34) _____
    A) 0.64 pounds   B) 3.65 pounds   C) 4 pounds   D) 3.64 pounds

35) In a laboratory course in veterinary biology, fleas gathered from Princess, a volunteered pet   35) _____
dog, averaged 0.168858 inch in length. Round this amount to the nearest thousandth.
    A) 0.169 inch   B) 0.170 inch   C) 0.168 inch   D) 1 inch

Solve the problem with estimation, but do not use a calculator. Use rounding to make the resulting calculations simple.
36) Estimate the cost to buy a refrigerator for $699, a stove for $759, and a dishwasher for $549.   36) _____
    A) $1800   B) $2100   C) $1900   D) $2000

37) Estimate the cost of 96 shirts at $19.95 each.   37) _____
    A) $2000   B) $200   C) $1995   D) $1915.20

38) If a person earns $29.55 per hour, estimate that person's annual salary.   38) _____
    A) $40,000   B) $50,000   C) $70,000   D) $60,000

39) Find an estimate of $\dfrac{0.284 \times 88}{0.503}$.   39) _____
    A) 176   B) 44   C) 11   D) 22

40) Estimate the number of seconds in a day.   40) _____
    A) 1,400 seconds   B) 600,000 seconds
    C) 3,600 seconds   D) 72,000 seconds

41) If a person earns $19,800 per year, estimate that person's hourly salary.   41) _____
    A) $50   B) $40   C) $10   D) $100

42) You rented an apartment for $780 per month for 11 years. What is the total amount you paid in   42) _____
rent?
    A) $13,200   B) $8800   C) $9600   D) $105,600

43) You spend $41.59 for a meal. If you want to leave a 15% tip, estimate the amount of the tip.   43) _____
    A) $8   B) $4   C) $6   D) $10

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

44) Four people share the use of a cable modem service that costs $49.95 a month.   44) _____

45) If Jessica can type 48 words per minute, estimate the number of words she can type in   45) _____
one hour.

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

The map shows main roads between various towns in a certain county. Use the map to answer the question.

46)   46) _____
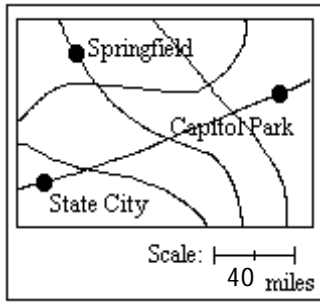
a. Estimate the distance from State City to Capitol Park.
b. If a vehicle travels at an average of 20 miles per hour, estimate the traveling time from State City to Capitol Park.

A) a. 160 miles	B) a. 120 miles	C) a. 80 miles	D) a. 40 miles
b. 8 hours	b. 6 hours	b. 4 hours	b. 2 hours

The circle graph shows the number of times a group of survey respondents watched the news in the past week. Use the chart to answer the question.
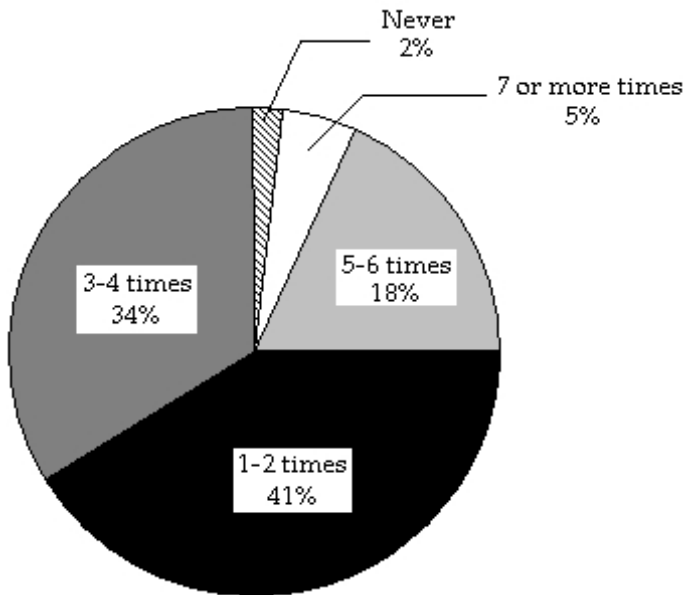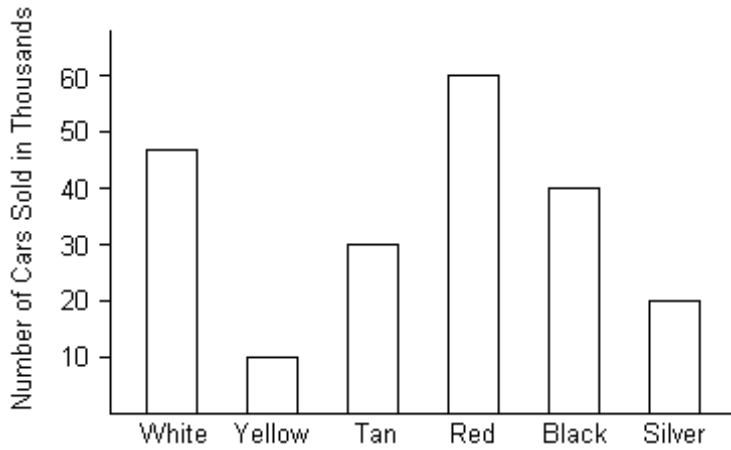

47) If the number of respondents in the study was approximately 44,397, estimate how many   47) _____
stated that they watched the news 5-6 times in the last week.
A) 10,000 respondents   B) 6000 respondents
C) 12,000 respondents   D) 8000 respondents

8

The bar graph below represents various colors of cars sold. Use the graph to answer the question(s).

48) Estimate the number of tan cars sold.   48) _____
    A) 35,000   B) 40,000   C) 30,000   D) 25,000

49) Estimate the number of white cars sold.   49) _____
    A) 52,000   B) 40,000   C) 47,000   D) 50,000

50) Which color sold over 50,000 cars?   50) _____
    A) Red   B) Tan   C) Silver   D) White

51) Which color sold under 20,000 cars?   51) _____
    A) Tan   B) Black   C) Yellow   D) White

52) Estimate how many more black cars were sold than silver cars.   52) _____
    A) 14,000   B) 31,000   C) 21,000   D) 11,000

53) Estimate how many more white cars were sold than tan cars.   53) _____
    A) 22,000   B) 7,000   C) 27,000   D) 17,000

The bar graph shows the percentages of health clubs in a large city that offer the service listed on the left. Use the graph to answer the question.
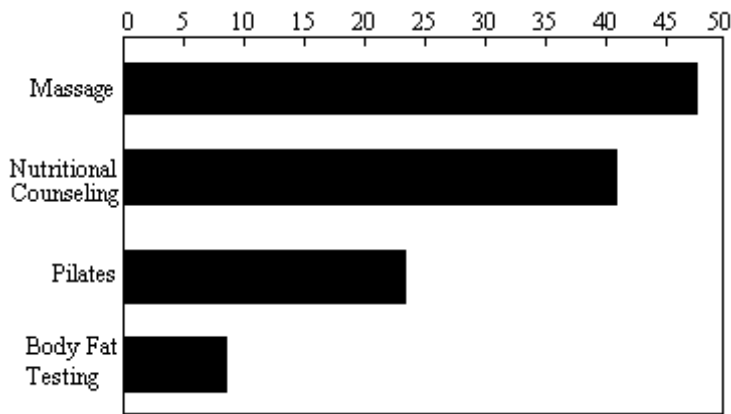

54) Estimate the percentage of health clubs in this city that offer body fat testing.   54) _____
   A) 4%   B) 14%   C) 11%   D) 8%

55) Which services are offered at at least 20% of this city's health clubs and at most 45% of the   55) _____
   clubs?
      A) Pilates, nutritional counseling, and body fat testing
      B) Pilates and nutritional counseling
      C) massage, Pilates and nutritional counseling
      D) massage, Pilates, nutritional counseling, and body fat testing

The bar graph shows the amount of scholarship money available to student athletes at State University in four consecutive years. Use the graph to answer the question.
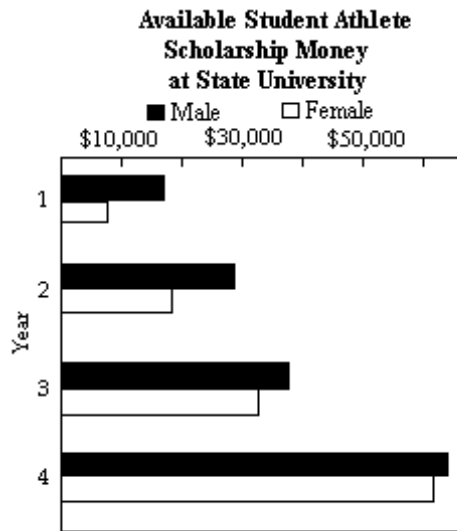
56) Estimate the amount of scholarship money available to female student athletes at State   56) _____
   University in year 3.
   A) $37,000   B) $33,000   C) $38,000   D) $4100

The line graph below shows the price of a stock over the course of the day. Use the graph to answer the question(s).
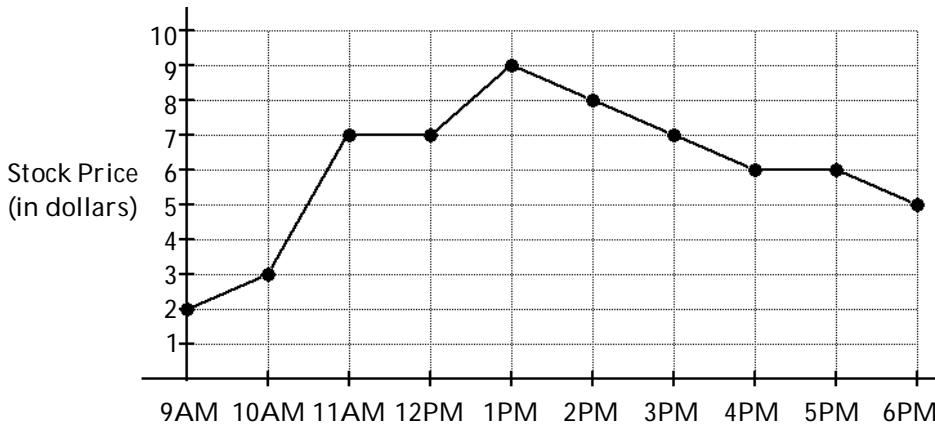
57) At what time was the stock price highest?   57) _____
    A) 1 PM   B) 2 PM   C) 12 PM   D) 9 AM

58) At what time was the stock price the lowest?   58) _____
    A) 10 AM   B) 9 AM   C) 1 PM   D) 6 PM

The line graph shows the pollution rate for a certain lake over six decades. Use the graph to answer the question.
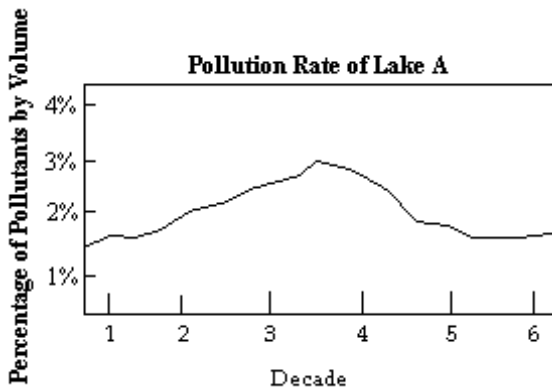
59) Find an estimate for the pollution rate of the lake at the beginning of decade 6. 59) _____
    A) 1%   B) 3%   C) 1.5%   D) 2.5%

The bar-graph shows the average living expenses of an undergraduate student. Provide an appropriate response.

Living Expenses for Undergraduate Students

60) Estimate the yearly increase in living expenses.   60) _____
   A) $750   B) $650   C) $450   D) $500

61) Write a mathematical model that estimates the average living expenses, E, of an undergraduate   61) _____
   student for x years after 2000.
   A) E = 5000 + 450x   B) E = 5000 + 500x   C) E = 5000 + 750x   D) E = 5000 + 650x

62) Use a mathematical model to predict the average living expenses of an undergraduate student   62) _____
   in 2007
   A) $9550   B) $10,250   C) $8150   D) $8500

State the necessary piece of information that is missing which prevents you from solving the problem.
63) A car traveled at an average rate of 53 miles per hour and then reduced its speed to 45 miles per   63) _____
   hour for the rest of the trip. If the trip took 4 hours, determine how long the car traveled at each
   rate.
   A) the time of day   B) the destination
   C) the distance of the trip   D) the time at each rate

Solve the problem. Then identify the piece of information that is unnecessary to solve the problem.
64) A rental car company that rents cars for local-only use charges $50 plus $0.20 for each mile the   64) _____
   rental car is driven. If a customer gives the rental attendant $100 for a charge of $60, how many
   miles did the customer drive?
   A) 49 miles
      unnecessary information: the $0.20 per-mile charge
   B) 25 miles
      unnecessary information: the $60 charge
   C) 50 miles
      unnecessary information: giving $100 to attendant
   D) 300 miles
      unnecessary information: the $50 flat charge

Use the four-step method in problem solving to solve the problem.
65) City A has an elevation of 3547 feet above sea level while city B has an elevation of 67 feet below   65) _____
   sea level. How much higher is City A than City B?
   A) -3380 feet   B) -3480 feet   C) 3714 feet   D) 3614 feet

12

66) Hannah owns 14 acres of land which she rents to a farmer for $2501 per acre per year. Her property taxes are $792 per acre per year. How much profit does she make on the land each year?

66) _____

A) $35,806   B) $46,102   C) $23,926   D) $34,222

67) At the beginning of the year, the odometer on an SUV read 37,839 miles. At the end of the year, it read 52,799 miles. If the car averaged 22 miles per gallon, how many gallons of gasoline did it use during the year?

67) _____

A) 68 gallons   B) 680 gallons
C) 14,960 gallons   D) 329,120 gallons

68) A couch sells for $1260. Instead of paying the total amount at the time of purchase, the same couch can be bought by paying $500 down and $80 a month for 12 months. How much is saved by paying the total amount at the time of purchase?

68) _____

A) $1080   B) $300   C) $20   D) $200

69) CD's were purchased at $65 per dozen and sold at $40 for four CD's. Find the profit on 9 dozen CD's.

69) _____

A) $25   B) $495   C) $225   D) $55

70) A college cafeteria pays student cashiers $7.70 per hour. Cashiers earn an additional $1.70 per hour for each hour worked over 35 hours per week. A cashier worked 41 hours one week and 39 hours the second week. How much did this cashier earn in this two-week period?

70) _____

A) $752.00   B) $556.00   C) $633.00   D) $616.00

71) A car rents for $200 per week plus $0.25 per mile. Find the rental cost for a three-week trip of 900 miles.

71) _____

A) $1275.00   B) $225.00   C) $425.00   D) $825.00

72) An accountant receives a salary of $271,250 per year. During the year, he plans to spend $98,000 on his mortgage, $56,000 on food, $35,000 on clothing, $46,000 on household expenses, and $28,000 on other expenses. With the money that is left, he expects to buy as many shares of stock at $250 per share as possible. How many shares will he be able to buy?

72) _____

A) 35 shares   B) 32 shares   C) 33 shares   D) 30 shares

73) Andrea decided to rollerblade to her mother's house. Six blocks from her home, one of the wheels on her skate broke, and she had to walk the remaining eight blocks to her mother's. She could not repair her skate and had to walk all the way back home. How many more blocks did Andrea walk than she skated?

73) _____

A) 22 blocks   B) 28 blocks   C) 14 blocks   D) 16 blocks

74) A store received 400 containers of milk to be sold by February 1. Each container cost the store $0.77 and sold for $1.56. The store signed a contract with the distributor in which the distributor agreed to a $0.50 refund for every container not sold by February 1. If 360 containers were sold by February 1, how much profit did the store make?

74) _____

A) $253.60   B) $284.40   C) $305.20   D) $273.60

Solve the problem using the strategy of making a list or using a diagram.

75) How many matches will be required to determine the champion in a single-elimination tennis tournament that starts with 60 players?   75) _____
   A) 30 matches   B) 50 matches   C) 60 matches   D) 59 matches

76) A coin is tossed five times. How many ways can it come up heads 4 times and tails once?   76) _____
   A) 4   B) 3   C) 2   D) 5

Solve the problem using the strategy of your choice.

77) Can you place the digits 1 through 9 into a 3 x 3 square so that each row, column, and diagonal add up to the same total? Four digits have been inserted.   77) _____

```
(  ) 1 (  )
3 (  )(  )
4 (  ) 2
```

A)
```
8  1  6
3  5  7
4  9  2
```

B)
```
6  1  8
3  5  7
4  9  2
```

C)
```
8  1  9
3  5  7
4  6  2
```

D)
```
8  1  7
3  5  6
4  9  2
```

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

78) Some numbers in the printing of a division problem have become illegible. They are designated below by *. Fill in the blanks.   78) _____

```
          1 * *
     * *)5 * * *
          3 6
        * 7 2
        * * *
        * * *
        * * *
            0
```

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

79) Three people have telephone prefixes whose three digits have the same sum. One of the prefixes is 448. None of the prefixes contains a digit that is in one of the other prefixes. None of the prefixes has a first digit of 6 or 1. One of the prefixes begins with 5. Another ends with 2. What is the prefix that ends with 2?   79) _____
   A) 772   B) 372   C) 592   D) 962

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80) Find the number of squares in the figure.   80) _____
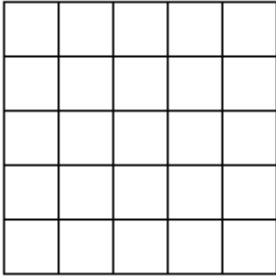
A) 25   B) 26   C) 55   D) 30

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

This exercise involves problems encountered in everyday life. Write seven or more short solutions that might be effective in solving the problem.

81) Your younger brother has just graduated college. You allow him to live in your house,   81) _____
rent-free, under the condition that he does all the household chores. However, after two
months of living with you, your brother has not done any chores. What actions can
you take to remedy this situation?

Solve the problem.

82) A certain Internet provider charges $16.95 for 150 hours of online usage per month and   82) _____
$0.95 for each additional hour. If Marc was online for 200 hours last month, what was
his bill for that month?

1) Answers may vary. Sandra Day O'Connor is one possible answer.
2) C
3) Answers may vary. Sample answer: George Washington was elected to two terms.
4) Answers may vary. Sample answer: Actor Jim Carrey is not an Academy Award winner.
5) C
6) D
7) D
8) D
9) B
10) C
11) C
12) B
13) B
14) B
15) B
16) D
17) B
18) C
19) B
20) A
21) D
22) C
23) B
24) A
25) 16, 25, 36
26) 10, 15, 21
27) A
28) B
29) A
30) D
31) C
32) A
33) C
34) D
35) A
36) D
37) A
38) D
39) B
40) D
41) C
42) D
43) C
44) $50 ÷ 4 = $12.50
45) 50 × 60 = 3000
46) B
47) D
48) C
49) C
50) A

51) C
52) C
53) D
54) D
55) B
56) B
57) A
58) B
59) C
60) B
61) D
62) A
63) C
64) C
65) D
66) C
67) B
68) D
69) B
70) C
71) D
72) C
73) D
74) D
75) D
76) D
77) A

78)
```
        148
   36) 5328
        36
        ‾‾‾
        172
        144
        ‾‾‾
        288
        288
        ‾‾‾
          0
```

79) A
80) C
81) Answers may vary. Possible answers may include:
    1. I could kick my brother out of my house.
    2. I could start charging my brother rent.
    3. I could make a list or schedule of chores that I want him to perform, in hopes of motivating him.
    4. I could offer my brother an additional incentive for each chore he performs.
    5. I could relentlessly follow my brother around the house to ensure that he performs his chores.
    6. I can throw out the agreement completely and allow him to live in my house for free.
    7. I could hire a maid and make my brother pay for it.
    8. I could change all the locks on the doors.
82) $64.45