Ch. 1   Problem Solving and Critical Thinking

1.1   Inductive and Deductive Reasoning

1   Understand and Use Inductive Reasoning

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.

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.
   A) The number is 0.   B) The number is 1.   C) The number is 0.1.   D) The number is $\frac{1}{2}$.

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.

4) All actors are Academy Award winners.

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) 6, 8, 10, 12, 14, ___
   A) 16   B) 18   C) 20   D) 15

6) 1, 20, 1, 30, 1, 40, 1, _____
   A) 50   B) 1   C) 60   D) 52

7) 37, 31, 25, 19, 13
   A) 7   B) 6   C) 2   D) 0

8) 5, –20, 80, –320, 1280
   A) –5120   B) 5120   C) –2240   D) 2240

9) $1, -\frac{1}{4}, \frac{1}{16}, -\frac{1}{64}, \frac{1}{256}$
   A) –1/1024   B) 1/1024   C) –1/4096   D) 1/4096
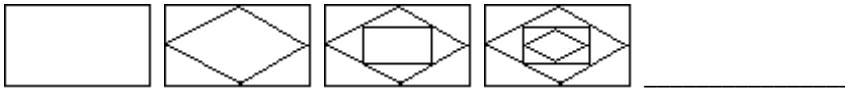
10) 2, 3, 4, 6, 8, 12
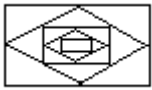   A) 16   B) 24   C) 12   D) 18

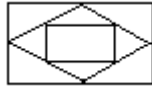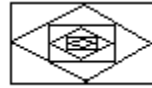**Identify a pattern in the sequence of figures. Then use the pattern to find the next figure in the sequence.**
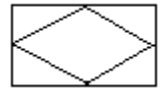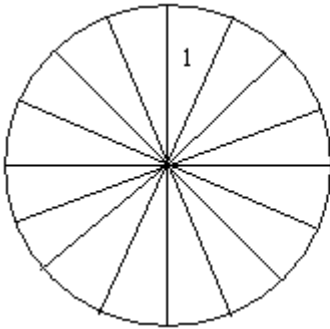
11)

A)   B)   C)   D)

12)
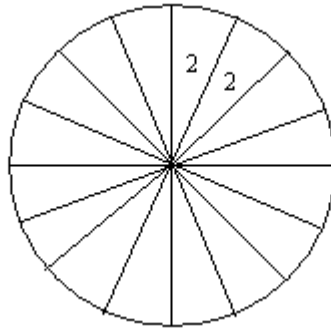
A)   B)

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 56. Add 56 to the product. Divide this sum by 28. Subtract 2 from the quotient.

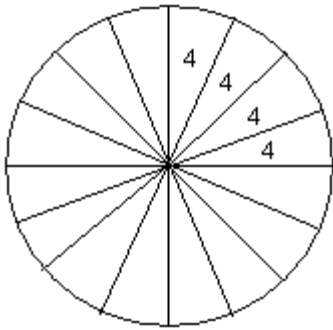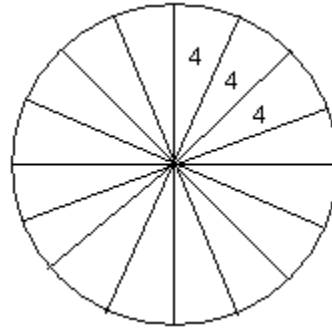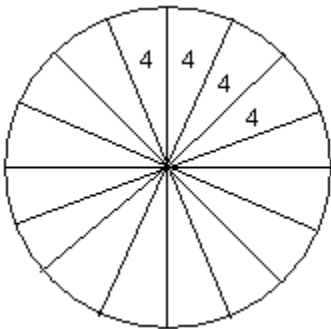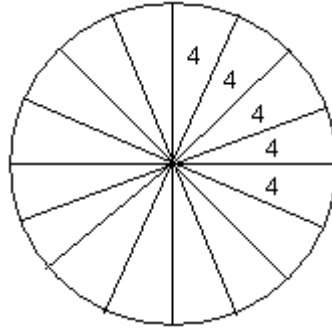   A) The result is double the original number.

    B) The result is 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) $40 - 9 = 31$
    $400 - 89 = 311$
    $4000 - 789 = 3211$

    A) $40,000 - 6,789 = 33,211$ B) $4000 - 6,789 = 33,211$

    C) $40,000 - 6,789 = 393,211$ D) $400,000 - 6,789 = 33,211$

15) $36 - 34 + 32 - 30 = 37 - 35 + 33 - 31$
    $46 - 44 + 42 - 40 = 47 - 45 + 43 - 41$

    A) $56 - 54 + 52 - 50 = 57 - 55 + 53 - 51$ B) $56 + 54 - 52 + 50 = 57 + 55 - 53 + 51$

    C) $56 - 54 - 52 + 50 = 57 - 55 + 53 - 51$ D) $56 + 54 - 52 - 50 = 57 + 55 - 53 + 51$

16) $6 \times 8 = 7 \times 9 - 15$
    $8 \times 10 = 9 \times 11 - 19$

    A) $10 \times 12 = 11 \times 13 - 23$ B) $10 \times 12 = 11 \times 13 - 21$

    C) $10 \times 12 = 13 \times 19 - 23$ D) $10 \times 12 = 11 \times 13 + 21$

17) $9 \times 9 = 81$
    $99 \times 99 = 9801$
    $999 \times 999 = 998,001$

    A) $9999 \times 9999 = 99,980,001$ B) $9999 \times 9999 = 999,001$

    C) $999 \times 9999 = 99,980,001$ D) $9999 \times 9999 = 1,000,001$

18) $19 \times 20 = 21 \times 22 - (19 + 20 + 21 + 22)$
    $20 \times 21 = 22 \times 23 - (20 + 21 + 22 + 23)$

    A) $21 \times 22 = 23 \times 24 - (21 + 22 + 23 + 24)$ B) $22 \times 23 = 24 \times 25 - (22 + 23 + 24 + 25)$

    C) $21 \times 22 = 23 \times 24 - (19 + 20 + 21 + 22 + 23 + 24)$ D) $22 \times 23 = 24 \times 25 - (21 + 20 + 19 + 18)$

19) $(1 \times 9) - 7 = 2$
   $(21 \times 9) - 7 = 182$
   $(321 \times 9) - 7 = 2882$

   A) $(4321 \times 9) - 7 = 38{,}882$

   B) $(4321 \times 9) - 7 = 28{,}882$

   C) $(4321 \times 9) - 7 = 3881$

   D) $(432 \times 9) - 7 = 38{,}882$

20) $(5 \times 1) \times (2 \times 1) = 10$
   $(5 \times 10) \times (2 \times 2) = 200$
   $(5 \times 100) \times (2 \times 3) = 3000$

   A) $(5 \times 1000) \times (2 \times 4) = 40{,}000$

   B) $(5 \times 1000) \times (2 \times 4) = 45{,}000$

   C) $(5 \times 1000) \times (2 \times 4) = 4000$

   D) $(5 \times 1000) \times (2 \times 4) = 35{,}000$

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) $37{,}037 \times 15 = 555{,}555$

   B) $37{,}037 \times 18 = 666{,}666$

   C) $37{,}037 \times 13 = 481{,}481$

   D) $111{,}111 \times 15 = 1{,}666{,}665$

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

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

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

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

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) $8(5) + 8(25) + 8(125) + 8(625) + 8(3125) = 10(3125 - 1)$

   B) $8(5) + 8(25) + 8(125) + 8(625) + 8(3125) = 8(3125 - 1)$

   C) $8(5) + 8(25) + 8(125) + 8(625) + 8(1250) = 10(1250 - 1)$

   D) $8(5) + 8(25) + 8(125) + 8(625) + 8(5000) = 10(5000 - 1)$

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	30	37	44			

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	30	37	44	51	58	65

b. 107 mg

B) a.

Weight	100	125	150	175	200	225
Dosage	30	37	44	51	55	56

b. 100 mg

C) a.

Weight	100	125	150	175	200	225
Dosage	30	37	44	51	51	51

b. 93 mg

D) a.

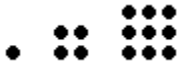| Weight	100	125	150	175	200	225
Dosage	30	37	44	51	141	171

b. 114 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.

2 Understand and Use Deductive Reasoning

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

Which reasoning process is shown in the following example?

1) We examine the genetic blueprints of 500 people. No two individuals from this group of people have identical genetic blueprints. We conclude that for all people, no two people have identical genetic blueprints.

A) inductive reasoning   B) deductive reasoning

C) reasoning by counterexample   D) theoretical reasoning

2) 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.

A) deductive reasoning   B) inductive reasoning

C) reasoning by counterexample   D) theoretical 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.

3) Select a number. Multiply the number by 16. Add 16 to the product. Divide this sum by 8. Subtract two from the quotient.

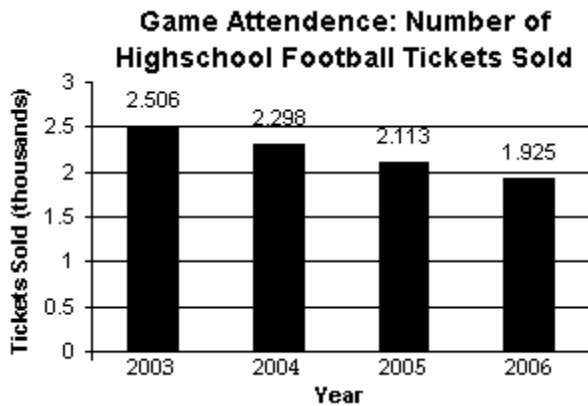A) $\dfrac{16n + 16}{8} - 2 = 2n + 2 - 2 = 2n$

B) $\dfrac{16n + 16}{16} - 2 = n + 1 - 2 = n - 1$

C) $\dfrac{16n + 8}{8} - 2 = 2n + 1 - 2 = 2n - 1$

D) $\dfrac{16n + 16}{16} - 1 = n + 1 - 1 = n$

Solve the problem.

4) 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 2003.

A) 2.5 – 0.2n   B) 2.5 + 0.2n   C) 2.5 – 1.02n   D) 2.5 + 1.02n

1.2 Estimation, Graphs, and Mathematical Models

1 Use Estimation Techniques to Arrive at an Approximate Answer to a Problem

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

Round the number to the given place value.

1) In 2005 a company spent $593,749,501 on advertising. Round the advertising figure to the nearest hundred thousand.

     A) $593,700,000   B) $600,000,000   C) $593,800,000   D) $500,000,000

2) A publishing company sold 46,265,591 books in 2005. Round the number of books sold to the nearest ten million.

     A) 50,000,000   B) 40,000,000   C) 46,000,000   D) 46,270,000

3) In a town in California, the average consumption of soft drinks per day per elementary school student is 15.766 ounces. Round this value to the nearest tenth.

     A) 15.8 ounces   B) 17 ounces   C) 15.7 ounces   D) 15.9 ounces

4) According to his ultra–precise scale, Freddy gained 3.619 pounds in a three–month period. Round this amount to the nearest hundredth.

     A) 3.62 pounds   B) 4 pounds   C) 0.62 pounds   D) 3.63 pounds

5) In a laboratory course in veterinary biology, fleas gathered from Muttsky, a volunteered pet dog, averaged 0.167467 inch in length. Round this amount to the nearest thousandth.

    A) 0.167 inch   B) 1 inch   C) 0.168 inch   D) 0.166 inch

Solve the problem with estimation, but do not use a calculator. Use rounding to make the resulting calculations simple.

6) Estimate the cost to buy a refrigerator for $799, a stove for $759, and a dishwasher for $349.

    A) $1900   B) $1700   C) $1800   D) $2000

7) Estimate the cost of 103 shirts at $19.95 each.

    A) $2000   B) $2054.85   C) $1995   D) $200

8) If a person earns $29.70 per hour, estimate that person's annual salary.

    A) $60,000   B) $50,000   C) $70,000   D) $40,000

9) Find an estimate of $\dfrac{0.275 \times 88}{0.475}$.

    A) 44   B) 22   C) 11   D) 176

10) Estimate the number of seconds in a day.

    A) 72,000 seconds   B) 3,600 seconds   C) 600,000 seconds   D) 1,400 seconds

11) If a person earns $19,550 per year, estimate that person's hourly salary.

    A) $10   B) $100   C) $50   D) $40

12) You rented an apartment for $775 per month for 6 years. What is the total amount you paid in rent?

    A) $57,600   B) $4800   C) $7200   D) $9600

13) You spend $40.57 for a meal. If you want to leave a 15% tip, estimate the amount of the tip.

   A) $6   B) $8   C) $4   D) $10

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

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

15) If Jessica can type 48 words per minute, estimate the number of words she can type in 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.

16)
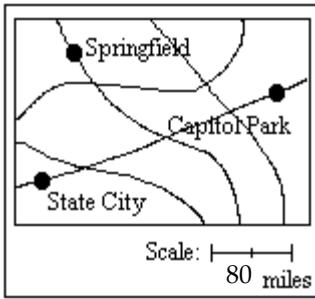
a. Estimate the distance from State City to Capitol Park.
b. If a vehicle travels at an average of 20 miles per hour, estimate the traveling time from State City to Capitol Park.

A) a. 240 miles	B) a. 80 miles	C) a. 160 miles	D) a. 320 miles
b. 12 hours	b. 4 hours	b. 8 hours	b. 16 hours

2   Apply Estimation Techniques to Information Given by Graphs

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

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.
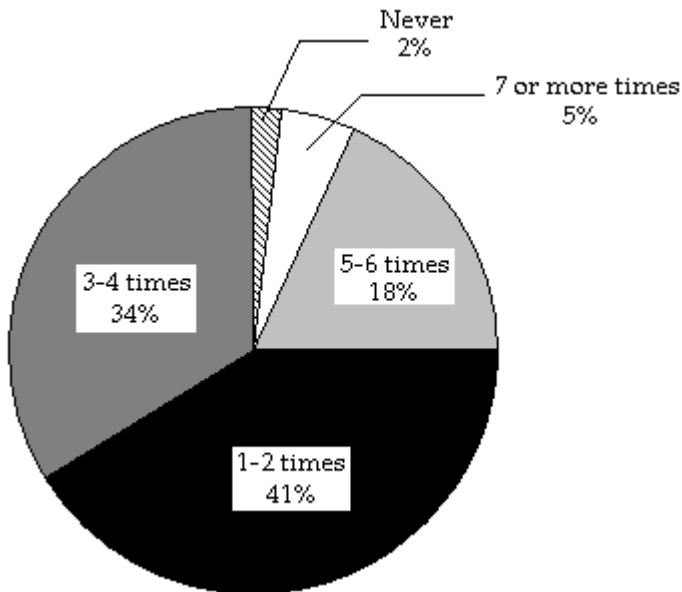
1) If the number of respondents in the study was approximately 44,209, estimate how many stated that they watched the news 5–6 times in the last week.
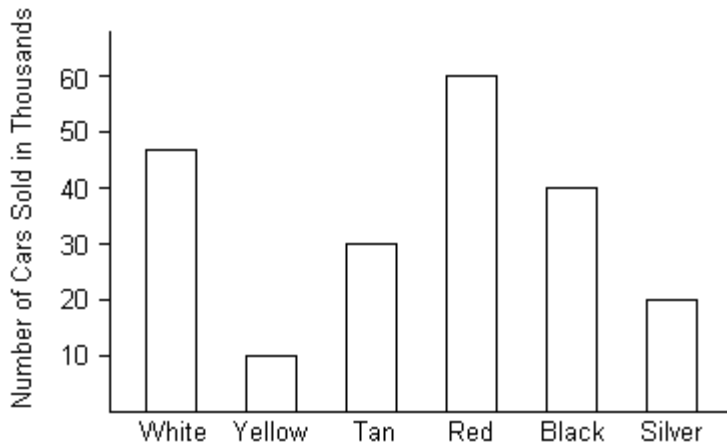
A) 8000 respondents   B) 10,000 respondents

C) 6000 respondents   D) 12,000 respondents

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

2) Estimate the number of tan cars sold.

A) 30,000   B) 25,000   C) 35,000   D) 40,000

3) Estimate the number of white cars sold.

A) 47,000   B) 50,000   C) 40,000   D) 52,000

4) Which color sold over 50,000 cars?

A) Red   B) White   C) Tan   D) Silver

5) Which color sold under 20,000 cars?

A) Yellow   B) White   C) Tan   D) Black

6) Estimate how many more black cars were sold than silver cars.

A) 21,000   B) 31,000   C) 11,000   D) 14,000

7) Estimate how many more white cars were sold than tan cars.

A) 17,000   B) 27,000   C) 7,000   D) 22,000

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.
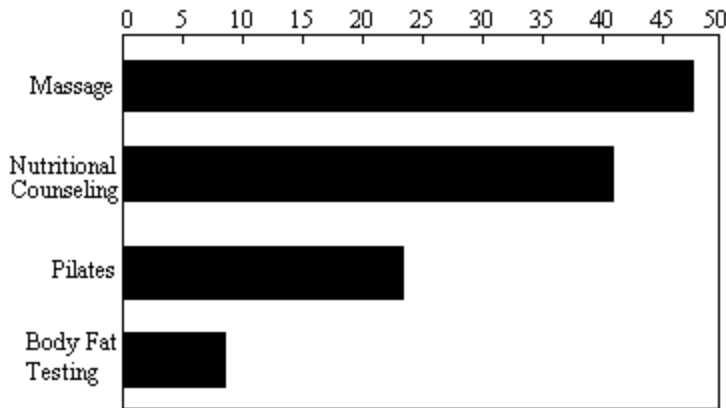

8) Estimate the percentage of health clubs in this city that offer Pilates.

A) 23%   B) 29%   C) 19%   D) 26%

9) Which services are offered at at least 20% of this city's health clubs and at most 45% of the clubs?

A) Pilates and nutritional counseling

B) massage, Pilates and nutritional counseling

C) Pilates, nutritional counseling, and body fat testing

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 by year. Use the graph to answer the question.
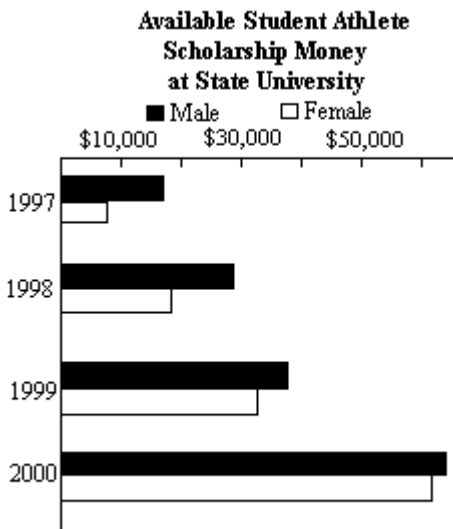
10) Estimate the amount of scholarship money available to female student athletes at State University in 1997.

A) $7000   B) $16,000   C) $11,000   D) $1900

The line graph below shows the price of a stock over the course of the day. Use the graph to answer the question(s).
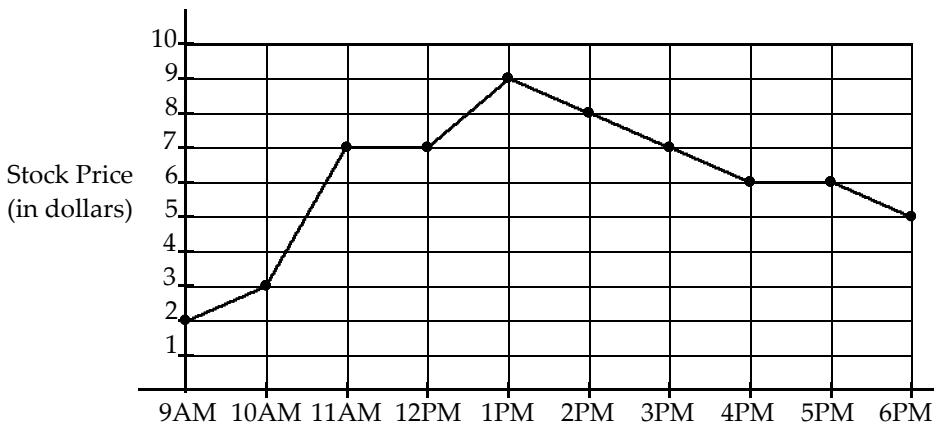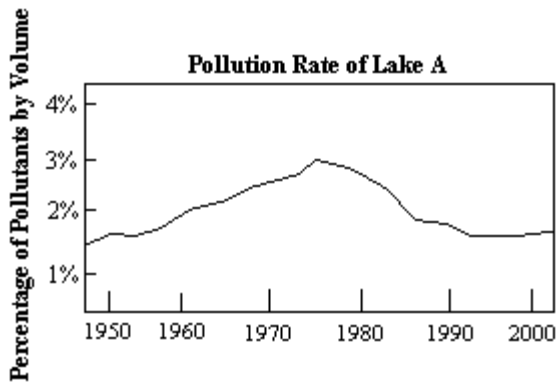

11) At what time was the stock price highest?

    A) 1 PM   B) 2 PM   C) 9 AM   D) 12 PM

12) At what time was the stock price the lowest?

    A) 9 AM   B) 10 AM   C) 1 PM   D) 6 PM

**The line graph shows the pollution rate for a certain lake from 1950 to 2000. Use the graph to answer the question.**

13) Find an estimate for the pollution rate of the lake in 1970.

    A) 2.5%   B) 2%   C) 3.5%   D) 4%

3 Develop Mathematical Models that Estimate Relationships Between Variables

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

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

Living Expenses for Undergraduate Students
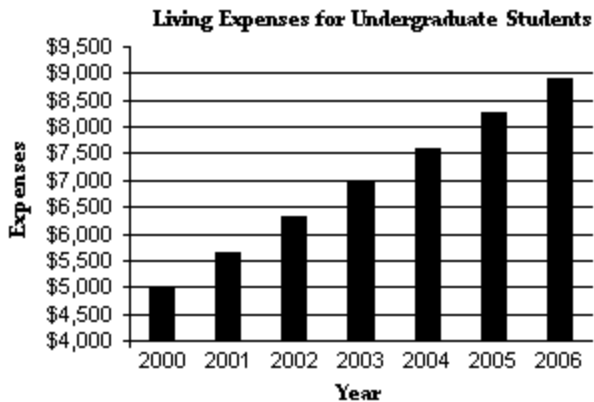
1) Estimate the yearly increase in living expenses.

    A) $650   B) $500   C) $450   D) $750

2) Write a mathematical model that estimates the average living expenses, E, of an undergraduate student for x
years after 2000.

    A) $E = 5000 + 650x$ B) $E = 5000 + 500x$ C) $E = 5000 + 450x$ D) $E = 5000 + 750x$

3) Use a mathematical model to predict the average living expenses of an undergraduate student in 2007

    A) $9550   B) $8500   C) $8150   D) $10,250

1.3   Problem Solving

1   Solve Problems Using the Organization of the Four–Step Problem–Solving Process

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

State the necessary piece of information that is missing which prevents you from solving the problem.

1) A car traveled at an average rate of 58 miles per hour and then reduced its speed to 46 miles per hour for the
rest of the trip. If the trip took 3 hours, determine how long the car traveled at each rate.

    A) the distance of the trip   B) the time at each rate

    C) the time of day   D) the destination

Solve the problem. Then identify the piece of information that is unnecessary to solve the problem.

2) A rental car company that rents cars for local–only use charges $30 plus $0.20 for each mile the rental car is driven. If a customer gives the rental attendant $100 for a charge of $42, how many miles did the customer drive?

    A) 60 miles
       unnecessary information: giving $100 to attendant

    B) 30 miles
       unnecessary information: the $42 charge

    C) 59 miles
       unnecessary information: the $0.20 per–mile charge

    D) 210 miles
       unnecessary information: the $30 flat charge

Use the four–step method in problem solving to solve the problem.

3) City A has an elevation of 3838 feet above sea level while city B has an elevation of 80 feet below sea level. How much higher is City A than City B?

    A) 3918 feet   B) –3758 feet   C) 4018 feet   D) –3658 feet

4) Lauren owns 17 acres of land which she rents to a farmer for $3672 per acre per year. Her property taxes are $956 per acre per year. How much profit does she make on the land each year?

    A) $46,172   B) $78,676   C) $61,468   D) $63,380

5) At the beginning of the year, the odometer on an SUV read 37,887 miles. At the end of the year, it read 53,297 miles. If the car averaged 23 miles per gallon, how many gallons of gasoline did it use during the year?

    A) 670 gallons   B) 15,410 gallons   C) 354,430 gallons   D) 67 gallons

6) A couch sells for $820. Instead of paying the total amount at the time of purchase, the same couch can be bought by paying $400 down and $60 a month for 12 months. How much is saved by paying the total amount at the time of purchase?

    A) $300   B) $960   C) $100   D) $30

7) CD's were purchased at $55 per dozen and sold at $40 for four CD's. Find the profit on 9 dozen CD's.

    A) $585   B) $135   C) $15   D) $65

8) A college cafeteria pays student cashiers $5.40 per hour. Cashiers earn an additional $1.10 per hour for each hour worked over 35 hours per week. A cashier worked 39 hours one week and 37 hours the second week. How much did this cashier earn in this two–week period?

    A) $417.00   B) $494.00   C) $410.40   D) $384.60

9) A car rents for $290 per week plus $0.10 per mile. Find the rental cost for a three–week trip of 600 miles.

    A) $930.00   B) $350.00   C) $60.00   D) $1050.00

10) An accountant receives a salary of $262,000 per year. During the year, he plans to spend $99,000 on his mortgage, $54,000 on food, $32,000 on clothing, $41,000 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?

    A) 32 shares   B) 29 shares   C) 34 shares   D) 31 shares

11) Andrea decided to rollerblade to her mother's house. Four blocks from her home, one of the wheels on her skate broke, and she had to walk the remaining six 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?

    A) 12 blocks   B) 16 blocks   C) 20 blocks   D) 10 blocks

12) A store received 500 containers of milk to be sold by February 1. Each container cost the store $0.75 and sold for $1.60. 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 440 containers were sold by February 1, how much profit did the store make?

    A) $359.00   B) $374.00   C) $410.00   D) $329.00

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

13) How many matches will be required to determine the champion in a single–elimination tennis tournament that starts with 60 players?

    A) 59 matches   B) 50 matches   C) 30 matches   D) 60 matches

14) A coin is tossed five times. How many ways can it come up heads 4 times and tails once?

    A) 5   B) 4   C) 3   D) 2

Solve the problem using the strategy of your choice.

15) 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.

```
( ) 7 ( )
 1 ( )( )
 8 ( ) 4
```

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

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

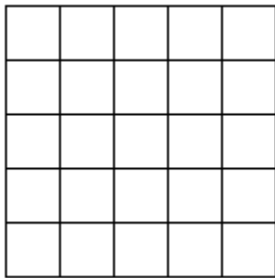C)
```
6 7 9
1 5 2
8 3 4
```

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

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

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

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

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

17) 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?

A) 772　　　　　　　　B) 592　　　　　　　　C) 372　　　　　　　　D) 962

18) Find the number of squares in the figure.

A) 55　　　　　　　　B) 26　　　　　　　　C) 25　　　　　　　　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.

19) Your younger brother has just graduated college. You allow him to live in your house, 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.

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

Ch. 1   Problem Solving and Critical Thinking
Answer Key

1.1   Inductive and Deductive Reasoning
1   Understand and Use Inductive Reasoning
1) Answers may vary. Sandra Day O'Connor is one possible answer.
2) A
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) A
6) A
7) A
8) A
9) A
10) A
11) A
12) A
13) A
14) A
15) A
16) A
17) A
18) A
19) A
20) A
21) A
22) A
23) A
24) A
25) 16, 25, 36
26) 10, 15, 21
2   Understand and Use Deductive Reasoning
1) A
2) A
3) A
4) A

1.2   Estimation, Graphs, and Mathematical Models
1   Use Estimation Techniques to Arrive at an Approximate Answer to a Problem
1) A
2) A
3) A
4) A
5) A
6) A
7) A
8) A
9) A
10) A
11) A
12) A
13) A
14) $50 ÷ 4 = $12.50
15) 50 × 60 = 3000
16) A

2 Apply Estimation Techniques to Information Given by Graphs
   1) A
   2) A
   3) A
   4) A
   5) A
   6) A
   7) A
   8) A
   9) A
   10) A
   11) A
   12) A
   13) A

3 Develop Mathematical Models that Estimate Relationships Between Variables
   1) A
   2) A
   3) A

1.3   Problem Solving

1 Solve Problems Using the Organization of the Four–Step Problem–Solving Process
   1) A
   2) A
   3) A
   4) A
   5) A
   6) A
   7) A
   8) A
   9) A
   10) A
   11) A
   12) A
   13) A
   14) A
   15) A

   16)

$$\begin{array}{r} 148 \\ 36\overline{)5328} \\ \underline{36} \\ 172 \\ \underline{144} \\ 288 \\ \underline{288} \\ 0 \end{array}$$

   17) A
   18) A
   19) 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.

20) $64.45