Use the space in the Test Book to do your work. Then mark your Test Book for the answer you have chosen. If you change your answer, be sure to erase completely.

1 The Footwear Company used the following graph to relate sales to profit.


What amount of sales, in dollars, generated $\$ 3500$ in profits?
A. $\$ 1500$
B. $\$ 3500$
C. $\$ 9500$
D. $\$ 10,500$

2 The scatter plot below shows the number of calories burned per minute while running, based on a runner's body weight.


Which statement below is best supported by this scatter plot?
F. As body weight increases, the number of calories burned per minute doubles.
G. As body weight increases, the number of calories burned per minute decreases.
H. As body weight increases, the number of calories burned per minute increases.
I. As body weight increases, the number of calories burned per minute remains the same.

3 On his mathematics test, Carlos had 20 correct out of 25 problems.
Which of the following is NOT another way of expressing 20 out of 25 ?
A. $\frac{4}{5}$
B. 0.80
C. $80 \%$
D. $\frac{5}{4}$

4 Fran purchased 2 pounds of walnuts at $\$ 4.89$ per pound and 2 pounds of chocolate chips at $\$ 2.48$ per pound. Which expression represents the total cost of Fran's purchases?
F. $2(4.89+2.48)$
G. $2(4.89 \times 2.48)$
H. $2+(4.89 \times 2.48)$
I. $(2+4.89) \times(2+2.48)$

5 When Ryan lifts weights for his first set, he lifts 15 pounds less than half of the maximum weight he can lift. This is represented by the equation below, where $m$ represents the maximum weight Ryan can lift, and $f$ represents the weight of his first set.

$$
f=\frac{1}{2} m-15
$$

If the weight of Ryan's first set is 135 pounds, what is the maximum weight he can lift?
A. $\quad 52.5$ pounds
B. $\quad 60.0$ pounds
C. $\quad 285.0$ pounds
D. 300.0 pounds

6 An architect designed a park with 5 different play areas as shown in the diagram below. $\equiv \equiv$
(B)

## (A)

(C)
(E)
(D)

The architect wants to connect each play area directly to each of the other play areas with cement walkways. The expression $\frac{n(n-1)}{2}$, where $n$ represents the number of play areas, can be used to determine how many different walkways are needed. How many walkways are needed to connect the 5 play areas?


## Page 8

7 The Hendersons are considering buying a house. They recorded mortgage interest rates for a six-month period, as shown in the chart below.

MORTGAGE INTEREST RATES

| Month | Interest Rate <br> (in percent) |
| :--- | :---: |
| March | 7.8 |
| April | 8.0 |
| May | 7.75 |
| June | 7.6 |
| July | 7.25 |
| August | 7.5 |

What was the mean mortgage interest rate, in percent, for this six-month period?


## Page 9

8 A city youth program has a total yearly budget of $\$ 220,000$. Of the total budget, $17 \%$ is spent on administrative costs, $25 \%$ is spent on supplies, and $30 \%$ is spent on art programs. The rest of the budget is spent on sports programs. How much is spent on sports programs?
F. $\$ 61,600$
G. $\$ 66,000$
H. $\$ 116,000$
I. $\$ 158,400$

9 Chang views the design below in his kaleidoscope. The outside border of the design is a regular octagon.


What is the measure, in degrees, of $\angle \mathrm{A}$ in the design?
A. 45
B. 90
C. 135
D. 180

10 Hilde wanted to draw a parallelogram on a coordinate plane.


She gave the following coordinates for three of the four vertices of the parallelogram: $(3,3),(5,1)$, and $(1,-3)$. Which coordinates best represent the location of the fourth vertex of the figure?
F. $(1,-1)$
G. $(-1,-1)$
H. $(-1,1)$
I. $(5,-4)$
(11) In its first design for a new park, the Park Service planned to build two rest areas. Each of the rest areas would be 6 kilometers from the Information Center, with Rest Area \#1 due north and Rest Area \#2 due east of the Center. The three locations would be connected by straight hiking trails, as shown in the diagram.


| SCALE |
| :---: |
| 1 km |
| $\square$ |

Part A The final plan added Rest Area \#3 to the design shown above, with straight hiking trails between all three rest areas and the Information Center. The point used to locate Rest Area \#3 was the reflection over the $x$-axis of the point that locates Rest Area \#1. What should be the coordinates of Rest Area \#3?

Coordinates of Rest Area \#3 $\qquad$
Part B To the nearest tenth kilometer, calculate the length of the shortest hiking trail from Rest Area \#2 to Rest Area \#3.

Length of trail $\qquad$

12 A marketing representative asked movie-ticket holders how they liked their popcorn served. The results are shown in the Venn diagram below.

POPCORN SURVEY


Part A Create a table, in the space below, that correctly represents all of the data in the Venn diagram.

Be sure to include:

- a title for the table - column labels - accurate information

Part B On the lines below, explain the significance of the number 7 on the diagram and give a reasonable explanation for its position on the diagram.

Explanation $\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$

Part C How many movie-ticket holders participated in the survey? $\qquad$

13 What is the value of the expression $2 \times 7^{2}-3 \times 8+6 \times 5+4$ ?
A. 108
B. 206
C. 3,834
D. 6,444

14 A star's color gives an indication of its temperature and age. The chart below shows seven types of stars and the lowest recorded temperature of each type.

STARS

| Type | Lowest Temperature <br> (in Fahrenheit degrees) | Color |
| :---: | :---: | :--- |
| A | $1.35 \times 10^{4}$ | Blue-White |
| B | $2.08 \times 10^{4}$ | Blue |
| F | $1.08 \times 10^{4}$ | White |
| G | $9.0 \times 10^{3}$ | Yellow |
| K | $6.3 \times 10^{3}$ | Orange |
| M | $5.4 \times 10^{3}$ | Red |
| O | $4.5 \times 10^{4}$ | Blue |

Which type of star has the lowest temperature?
F. B
G. G
H. M
I. O

15 As Uranus orbits the Sun, the distance from its closest point to the Sun, or its perihelion, is 1703 million miles. The distance from its farthest point, or its aphelion to the Sun, is $1.866 \times 10^{9}$ miles. What is the difference in these distances?
A. $\quad 1.63 \times 10^{8}$ miles
B. $163 \times 10^{8}$ miles
C. $\quad 1.701 \times 10^{9}$ miles
D. $1701 \times 10^{9}$ miles

16 The brightest star in the Milky Way galaxy, Pistol, was discovered in 1997. Pistol is ten million times brighter than the Sun. What is the exponent associated with base 10 when ten million is written in scientific notation?


17 Lee's aerobics instructor told the class that a person should maintain a target heart rate for at least 20 minutes. The equation $t=0.7(220-a)$, where $a$ represents the person's age in years and $t$ represents the target heart rate, can be used to find the person's target heart rate. What is the target heart rate of a person who is 14 years old?


18 Nina is taking a dance class twice a week for 6 weeks. Each class will last F $1 \frac{1}{2}$ hours. How many hours all together will Nina have spent in dance
class at the end of the 6 weeks?


19 Laura made a compost bin with the dimensions shown.


She wants to double the volume of the bin. Which of the following bins will have a volume that is twice the volume of Laura's bin?

F.

G.


12 feet
H.

I.

20 Tran designed this shipping box for a freight company.


Which of the patterns below could be folded to make the shipping box?


21 Marie is using orange juice in an experiment on citric acid. She will conduct the experiment 30 times and will use 4 ounces of juice for each experiment. How many quarts of orange juice will Marie use to complete all the experiments?
F. 30 quarts
G. 15 quarts
H. $\quad 7.5$ quarts
I. $\quad 3.75$ quarts

22 Mandy worked at a supermarket offering customers samples of new fruit drinks. Each customer selected and sampled one flavor. Mandy recorded the number of original and remaining samples by flavor on the chart.

BOTTLED SAMPLES

| Flavor | Original Number <br> of Samples | Remaining Number <br> of Samples |
| :--- | :---: | :---: |
| Lemon | 300 | 25 |
| Orange | 400 | 93 |
| Strawberry | 350 | 43 |

Which of the following statements is supported by the data in the chart?
A. Lemon was selected the greatest number of times.
B. Orange was selected the greatest number of times.
C. Lemon and orange were selected an equal number of times.
D. Orange and strawberry were selected an equal number of times.

23 The rates for Aaron's cellular phone service are displayed below.


PHONE RATES

| Weekdays | $\$ 0.12$ per minute |
| :--- | :--- |
| Weeknights | $\$ 0.07$ per minute |
| Weekends | $\$ 0.05$ per minute |

During the first month Aaron used his phone for 151 minutes on weekends, 200 minutes on weeknights, and 32 minutes on weekdays. According to the rates on the chart, how much should Aaron be charged for his phone service the first month?


24 A used-car dealer needed to sell a car. He priced it at $\$ 4500$ the first day it was on the lot. The second day he reduced the price by $5 \%$. What was the price of the car after this reduction?


## Page 21

25 A craft shop makes small rectangular display cases that are 6 inches by 3 inches by 2 inches. The cases are shipped in rectangular boxes that are 10 inches by 6 inches by 4 inches. The extra space in the packing box is filled with packing material to protect the display case.


Find the volume of the space in the box that is filled with packing material. Show your work or explain in words how you found your answer.

Volume $\qquad$

Page 22

26 The General Sherman Tree in Sequoia National Park, California, has grown to be 275 feet tall and is about 3,000 years old. The diagram below shows the approximate height, in feet, of the General Sherman Tree at various ages.


Assuming the tree grew at a steady rate, what was the height of the tree, in feet, at 500 years of age?
F. 23 feet
G. 69 feet
H. 160 feet
I. 183 feet

27 Ms. Jacques bought some candles that are advertised to burn for 30 hours. She used one of the candles until it had burned down as shown.


Which is closest to the number of hours remaining until the used candle burns completely?
A. 10 hours
B. 15 hours
C. 20 hours
D. 25 hours

28 A plane is flying at an altitude of 27,000 feet. The pilot of the plane is trying to avoid a storm and increases the plane's altitude by ascending 3,500 feet. When the pilot sees he has not ascended far enough to avoid the storm, he ascends another 5,000 feet and finally another 2,500 feet. What is the plane's new altitude?
F. 11,000 feet
G. 16,000 feet
H. 23,000 feet
I. 38,000 feet

29 A brochure advertises a new public golf course. The cover of the brochure shows a picture of the 18th hole on the course.


The distance from the tee to the 18th hole is 4.5 inches on the brochure. Based on the scale above, what is the distance in yards?
A. 900 yards
B. 450 yards
C. 225 yards
D. 113 yards

30 In 1900 John Herlinger set the record for the longest walk on hands. He walked on his hands from Vienna, Austria, to Paris, France, over a period of 55 days. Every day he walked for 10 hours, averaging a speed of 1.58 miles per hour. What is the total number of miles John Herlinger walked on his hands to set the record?


31 The world's largest fish is the whale shark, which grows to be as much as 60 feet in length.


Rhonda wants to draw a picture of a 60 -foot whale shark using a scale of $\frac{1}{4}$ inch $=5$ feet. What will be the length, in inches, of the whale in her drawing?

(32) Sabrina enjoys sailing. She wants to build this model sailboat:


What is the height of the model's sail in centimeters (cm)?


33 Line RS represents a skateboard ramp.


What is the slope of the ramp?
F. $\frac{2}{3}$
G. $\frac{3}{2}$
H. $\quad-\frac{2}{3}$
I. $-\frac{3}{2}$

34 An architect is designing the layout of underground pipes to drain water from a large piece of property that is being developed. The pipes must drop $\frac{1}{4}$ inch for each 10 feet of the pipe's length.

Surface of the ground

125 Feet
10 Feet

UNDERGROUND DRAIN PIPE

Part A Write an equation that can be used to find the total amount of drop for the length of a pipe in feet.

Let $d$ represent the total amount of drop, and let $l$ represent the length of a pipe.

Equation $\qquad$

Part B Use your equation to calculate the total drop, in inches, of a 125 -foot-long section of this pipe. Show your work.

Work Space

Total inches of drop $\qquad$

35 In graphics class, Ben made two prints of trees on similar sheets of paper.



TREE A


TREE B

Part A Write a proportion, using $w$ and $h$, which could be used to find the width of the paper used for Tree A or the height of the paper used for Tree B.

Proportion $\qquad$
Part B If the width of the paper used for Tree A is 6 units, what is the height of the paper used for Tree B ?

Height of paper used for Tree B $\qquad$ units

Part C Ben created another similar print, Tree C on a sheet of paper that had a height of 36 units. What was the width of the paper?

Width of the paper for Tree C $\qquad$ units

36 Ryan made clay models of each member of his family. The model of his father is 8 inches tall. His father is actually 6 feet tall. Ryan will use the scale factor from his father's model to make a model of his brother. If Ryan's brother is actually $4 \frac{1}{2}$ feet tall, how tall, in inches, should Ryan make the model of his brother?
A. $1 \frac{3}{4}$ inches
B. $3 \frac{1}{3}$ inches
C. 5 inches
D. 6 inches

37 One of the banks in Key West is moving to a new office building. The floor plan of the new location is shown below. All of the offices around the perimeter of the building have windows. The three corner offices have been assigned to managers, and a random drawing will be used to assign the remaining offices.

FLOOR PLAN

| Manager | office | office | Manager |
| :---: | :---: | :---: | :---: |
| office | office |  |  |
| rest <br> room |  | office |  |
| elevator | office | office | office |
| stairs | office | office | Manager |

What are the odds in favor of the next person being assigned an office with a window?
F. 8 to 4
G. 4 to 8
H. 11 to 4
I. 4 to 11

38 James has a rectangular office that measures 6 feet by 10 feet. He will be moving to an office that is 2 feet longer and 2 feet wider. How much more area will James have in his new office?
A. 4 square feet
B. 36 square feet
C. 60 square feet
D. 96 square feet

39 Dan is making a rectangular flower box. He is using wood that is 2 inches wide to make the flower box. The diagram below shows how the completed flower box will look from above.


What is the perimeter, in inches, of the outside of the flower box?


## Page 33

40 Betsy and five of her friends joined a summer reading program at the library. The table below shows the number of books each person has read so far.

SUMMER READING CLUB

| Name | Number of <br> Books Read |
| :--- | :---: |
| Betsy | 14 |
| Damian | 16 |
| Javier | 20 |
| Lupe | 12 |
| Roger | 12 |
| Suzanne | 10 |

What is the median number of books read by the six students listed in the table above?


41 The low temperatures for 6 consecutive days in a Montana city were $9^{\circ}, 3^{\circ}, 4^{\circ}, 16^{\circ}, 11^{\circ}$, and $5^{\circ}$. What would the low temperature have to be on the seventh day to have a mean low temperature of $9^{\circ}$ for the week?
F. $\quad 8^{\circ}$
G. $9^{\circ}$
H. $15^{\circ}$
I. $20^{\circ}$

42 The graph below shows the number of asthma cases per 100 people in the United States from 1982 to 1994.

ASTHMA CASES PER 100 PEOPLE IN THE UNITED STATES


Which of the following claims can be supported by this data?
A. In 1989, approximately $4 \%$ of the people in the United States had asthma.
B. In 1990, between $4 \%$ and $5 \%$ of the people in the United States had asthma.
C. Between 1990 and 1991, there was a decrease in the asthma rate for all ages.
D. Between 1989 and 1990, there was an increase in the asthma rate for all ages.

43 Crista works for a company that cuts down diseased palm trees before they fall and cause damage. She must determine the height of the palm tree.


Crista is 5 feet tall and has measured her shadow to be 6 feet long. At the same time, she measured the tree's shadow to be 27 feet long. What is the height ( $h$ ) of the palm tree?
F. 16 feet
G. 22.5 feet
H. 26 feet
I. $\quad 32.4$ feet

44 What value of $x$ makes this equation true?

$$
x+6 \div 3=17
$$

A. 15
B. 45
C. 51
D. 58

45 Audrey's parents gave her $\$ 5$ to play video games at the mall. Each game costs a quarter to play. Which choice is NOT a correct method for determining the total number of games she can play?
F. Take the number of dollars she has and divide it by $\frac{1}{4}$.
G. Take the number of dollars she has and multiply it by 4 .
H. Take the number of dollars she has and divide it by 0.25 .
I. Take the number of dollars she has and multiply it by 0.25 .

46 Mario wants to rent a video game system. A video game system costs $\$ 10.00$ to rent for three days. Each game costs $\$ 4.00$ per day to rent.

Part A
Complete the table below to show how many dollars Mario will have to spend to rent the video game system and one game for the number of days given.

## VIDEO SYSTEM AND GAME RENTALS

| Number of <br> Days | Total Cost |
| :---: | :---: |
| 3 |  |
| 6 |  |
| 9 |  |
| 12 |  |

## Part B

How much will Mario have to pay if he wants to rent three games and the video game system for 15 days?

Amount $\qquad$

47 The line segments composing both shapes below are all congruent. The perimeter of the triangle is 36 units in length.


What is the perimeter, in units, of the square?


48 A cargo ship can hold up to 500 tons of cargo. The chart below shows how the distance from the water line to the bottom of the ship (the draft depth) is affected by the number of tons of cargo the ship is carrying.

DRAFT DEPTH OF SHIP

| Cargo <br> (in tons) | Draft Depth <br> (in feet) |
| :---: | :---: |
| 15 | 20 |
| 20 | 22.5 |
| 25 | 25 |
| 30 | 27.5 |
| 35 | 30 |

If the pattern in the chart continues, what will be the draft depth of the ship, in feet, if the ship is carrying 40 tons of cargo?


49 The value of a painting in Erin's Gallery may increase by as much as $4 \%$ of its current value from one month to the next. The gallery values a certain painting at $\$ 500.00$ in November. Which of the inequalities below represents the painting's possible values (v) in December?
A. $500 \leq v \leq 520$
B. $500 \leq v \leq 700$
C. $500 \geq v \geq 520$
D. $500 \geq v \geq 700$

50 Soon after a young duckling hatches, it considers the first thing it sees to be its mother. This process can happen only during a certain period of time called the "critical window." The critical window is greater than 2 hours and continues for no more than 36 hours after hatching, as shown in the inequality below.

$$
2<\text { critical window } \leq 36
$$

Which is the correct graph of this inequality?
F.

G.

H.

I.


## Page 41

