

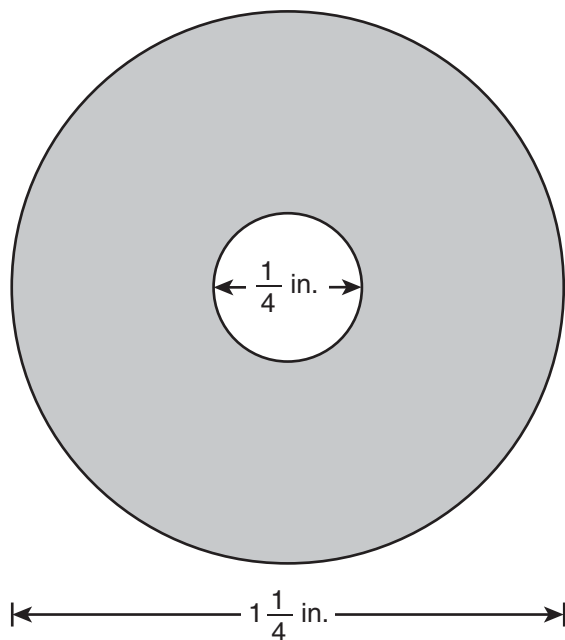
GRID-IN QUESTIONS

QUESTIONS 58–62

DIRECTIONS: Solve each problem. On the answer sheet, write your answer in the boxes at the top of the grid. Start on the left side of each grid. Print only one number or symbol in each box. Under each box, fill in the circle that matches the number or symbol you wrote above.

- Do not fill in a circle under an unused box.
- Do not leave a box blank in the middle of an answer.

58. The figure below shows a circle with a hole in the middle. The outer diameter of the circle is $1\frac{1}{4}$ inches. The diameter of the hole is $\frac{1}{4}$ inch.



What is the area of the shaded region, to the nearest hundredth of a square inch?

59. A homeowner has a budget of \$135 for the installation of a light fixture. An electrician charges \$60 per hour plus a one-time trip charge of \$45. What is the **greatest** amount of time, in hours, the electrician can work on the installation while staying within the homeowner's budget? Write your answer as a decimal.

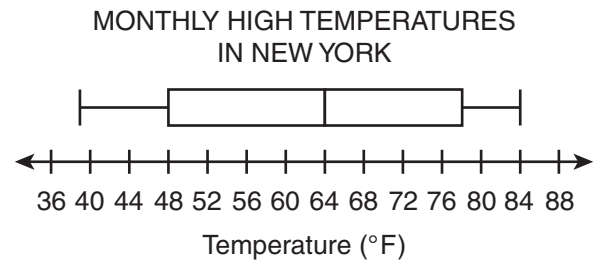
60. The list shows the daily low temperatures in a city during six days in the winter.

7° F, 4° F, 1° F, -2° F, -5° F, 3° F

What is the difference between the lowest and highest temperatures, in degrees Fahrenheit, for the six days?

- 61.** A grocery store sells 1-gallon containers of milk for \$3.99. The store also sells orange juice in a 6-pack of 5.5-fluid-ounce bottles for \$1.79. Suppose the store wants to sell its orange juice in gallon containers instead. To the nearest dollar, how much more would a gallon of orange juice cost than a gallon of milk?

62.



The box plot shows the average monthly high temperatures in New York City for 12 months. What is the difference between the range and the interquartile range of the temperature data?

MULTIPLE CHOICE QUESTIONS

QUESTIONS 63–114

DIRECTIONS: Solve each problem. Select the answer from the choices given. Mark the letter of your answer on the answer sheet. When you are solving problems, you can write in the test booklet or on the scrap paper given to you.

63. What is the prime factorization of 756?

- A. $2^2 \cdot 3^2 \cdot 21$
- B. $2^2 \cdot 3 \cdot 7 \cdot 9$
- C. $2^2 \cdot 7 \cdot 27$
- D. $2^2 \cdot 3^3 \cdot 7$

64.

$$\frac{x^2y^6}{xy^2}$$

What is the value of the expression above if $x = -2$ and $y = 2$?

- E. -64
- F. -32
- G. 16
- H. 32

65. If $(8 \div m) + 4 = 20$, what is the value of m ?

- A. $\frac{1}{3}$
- B. $\frac{1}{2}$
- C. 2
- D. 3

66. $6x = x - 1,680$

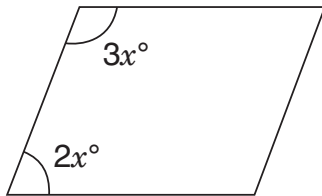
What is the value of x in the equation shown above?

- E. 336
- F. 240
- G. -240
- H. -336

67. A person buys a used car with a down payment of \$1,200 and makes monthly payments of \$275 for 3 years. What is the total amount the person pays for the car?

A. \$2,025
B. \$9,900
C. \$11,100
D. \$13,500

68.



In the parallelogram above, what is the value of x ?

E. 36
F. 18
G. 6
H. 5

69. A bus begins its trip with R occupants (including the driver). At each of the 20 stops, 3 people get on and no one leaves. If there are 3 times as many bus occupants at the end of the 20th stop as there are at the end of the 4th stop, how many occupants did the bus have immediately after the 10th stop?

A. 12
B. 24
C. 30
D. 42

70. Jay sold n tickets. Pilar sold three times as many tickets as Jay did. Together, Jay and Pilar sold ten more tickets than Amie sold. Which expression shows how many tickets Amie sold?

E. $10 - 4n$
F. $3n^2 + 10$
G. $4n + 10$
H. $4n - 10$

71.

$$-12 > 6x$$

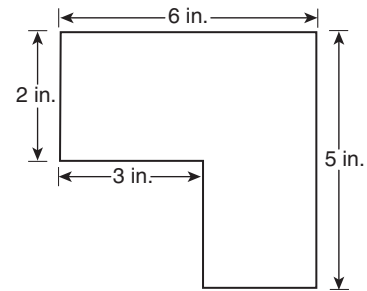
For what values of x is the above inequality true?

- A. $x > -6$
- B. $x < -6$
- C. $x < -2$
- D. $x > -2$

72. If $5(x - 6y) = 50y$, what is the value of x in terms of y ?

- E. $16y$
- F. $15y$
- G. $11\frac{2}{5}y$
- H. $11y$

73.



Scale: $\frac{1}{2}$ in. = 25 ft

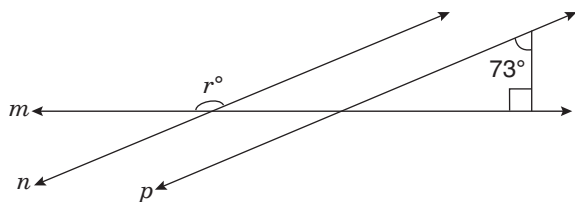
A scale drawing of a new pool is shown above. All the corners are right angles. What is the perimeter of the actual pool?

- A. 550 ft
- B. 800 ft
- C. 1,100 ft
- D. 1,500 ft

74. Maria rides her bicycle to school at a constant speed of 15 miles per hour. If the distance to school is 6 miles, how many **minutes** will it take Maria to get to school?

- E. 10
- F. 15
- G. 24
- H. 30

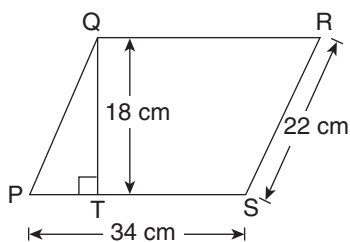
75.



In the figure above, $n \parallel p$. Straight line m intersects both line n and line p . What is the value of r ?

- A. 17
- B. 117
- C. 163
- D. 173

76.



On parallelogram PQRS above, the length of $\overline{QT}$ is 18 centimeters. What is the area of the parallelogram?

- E. 112 sq cm
- F. 396 sq cm
- G. 612 sq cm
- H. 748 sq cm

77. Allison has 5 stamp albums with 576 stamps in each album. If she transfers her stamp collection to 6 albums, each holding 378 stamps, how many stamps will be left over?

- A. 198
- B. 612
- C. 620
- D. 632

78. Start with the number 135.28 and perform the following steps in order:

- Step 1: Multiply by 10.
- Step 2: Add 0.5 to the result of Step 1.
- Step 3: Drop the digits after the decimal point.
- Step 4: Divide by 10.

What is the result?

- E. 13.5
- F. 135
- G. 135.2
- H. 135.3

79. If $x = -2$, what is the value of $|x + x^2 + x^3| - |x + 2x + 3x|$?

- A. -18
- B. -6
- C. -2
- D. 2

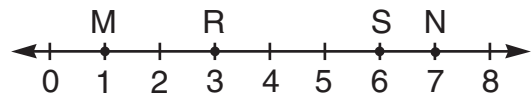
80. $\frac{3 + (-3)}{3 - (-3)} =$

- E. -1
- F. 0
- G. $\frac{1}{6}$
- H. 1

81. $12.96 \div 0.08 =$

- A. 1.62
- B. 16.2
- C. 162
- D. 1,620

82.



What is the distance between the midpoints of $\overline{MN}$ and $\overline{RS}$?

- E. $\frac{1}{2}$ unit
- F. 1 unit
- G. $1\frac{1}{2}$ units
- H. 2 units

83.

- I. $s - t$
- II. st^2
- III. s^t

If s is a positive integer and t is a negative integer, which of the above expressions **must** be a positive number?

- A. II only
- B. I and II only
- C. II and III only
- D. I, II, and III

84. What is the value of $\left(-\frac{3}{4}\right)\left(-\frac{2}{5}\right)$?

E. $-\frac{7}{20}$

F. $-\frac{3}{10}$

G. $\frac{3}{10}$

H. $\frac{7}{20}$

85. The table shows the income and expenses in a bicycle shop on one day.

BICYCLE SHOP TRANSACTIONS

Description	Income	Expense
Paid employees		\$120 $\times$ 4
Sold 2 bicycles	\$400 $\times$ 2	
Sold clothing	\$95	
Bought new door		\$500
Sold bike parts	p	

The sum of all transactions was \$70. What is the value of p ?

A. $-\$275$

B. $-\$85$

C. \$70

D. \$155

86. Dakota has four yardsticks and two 12-inch rulers. If she lays all four of the yardsticks and both rulers end-to-end, what is the maximum number of feet she can measure accurately at once?

E. 12 ft

F. 14 ft

G. 16 ft

H. 18 ft

87. In a fruit basket, the ratio of apples to oranges is the same as the ratio of cherries to walnuts. If there are 6 oranges, 16 cherries, and 48 walnuts, how many apples are there?

- A. 2
- B. 3
- C. 18
- D. 38

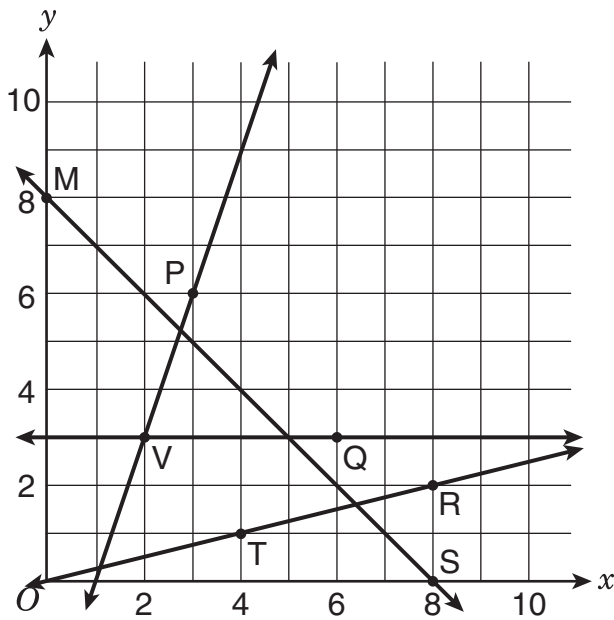
88. In a showing of an artist's works, the ratio of the number of paintings, drawings, and photographs shown is 3:5:4, respectively. If the number of drawings shown was 45, what is the total number of photographs and paintings that were shown?

- E. 36
- F. 63
- G. 84
- H. 108

89. For each $\frac{3}{8}$ foot of curtain width, $\frac{5}{6}$ yard of fabric is needed to make ruffles. How many yards of fabric are needed per foot of curtain width?

- A. $\frac{5}{16}$ yd
- B. $\frac{29}{24}$ yd
- C. $\frac{20}{9}$ yd
- D. $\frac{7}{2}$ yd

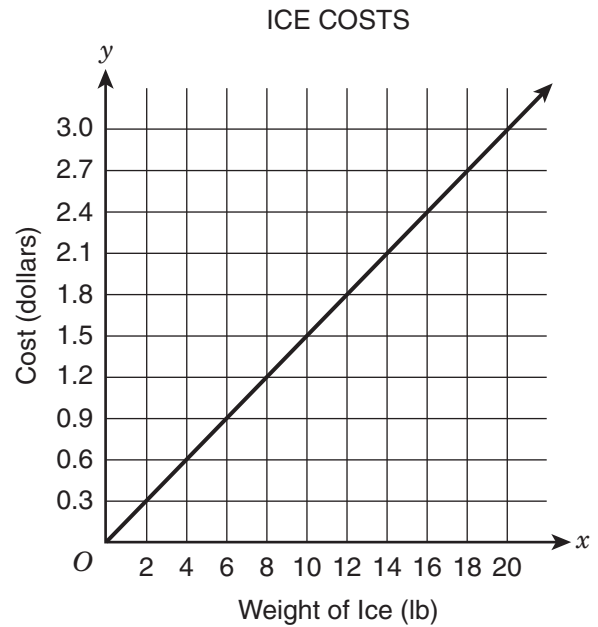
90.



Which straight line is the graph of a proportional relationship?

- E. $\overleftrightarrow{MS}$
- F. $\overleftrightarrow{VP}$
- G. $\overleftrightarrow{VQ}$
- H. $\overleftrightarrow{TR}$

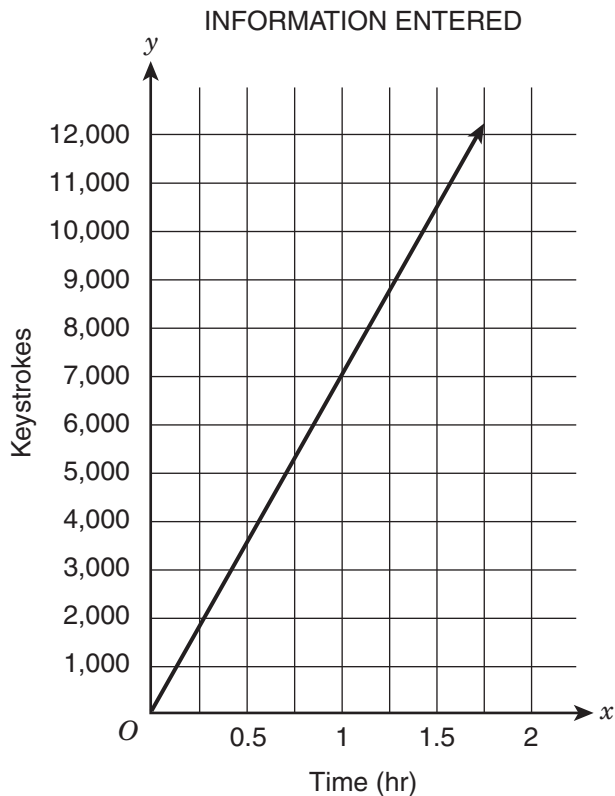
91.



Some friends are buying bags of ice for a picnic. The graph shows the cost of the ice, in dollars, in relation to the weight, in pounds. Which statement about a point on the graph is true?

- A. The point (20, 3) means that 3 lb of ice costs \$20.00.
- B. The point (1, 0.15) means that 1 bag of ice costs \$0.15.
- C. The point (10, 1.5) means that 10 lb of ice costs \$1.50.
- D. The point (0, 0) means that 0 lb of ice will be needed if 0 people go to the picnic.

92.



A clerk enters information on a computer. The graph shows the relationship between time, in hours, and the number of keystrokes the clerk makes. What is the meaning of the point (1.5, 10500) on the graph?

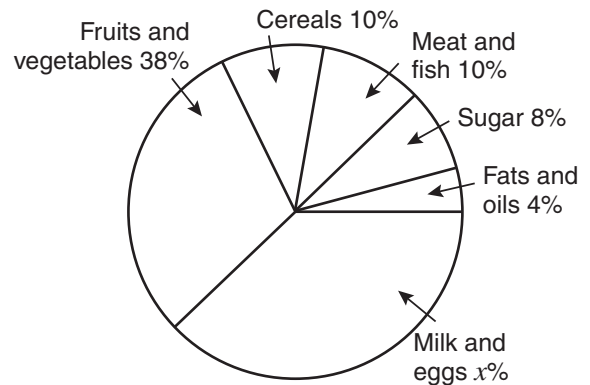
- E.** The clerk makes 10,500 keystrokes in each 1 hr of entering information.
- F.** The clerk makes 10,500 keystrokes in each 1.5 hr of entering information.
- G.** The clerk makes 15,750 keystrokes in each 1 hr of entering information.
- H.** The clerk makes 15,750 keystrokes in each 1.5 hr of entering information.

93. When the three-digit whole number $27 \underline{\quad} ?$ is divided by 3 or by 4, the remainder is zero. What is the missing digit?

- A.** 0
- B.** 2
- C.** 3
- D.** 6

94.

FOOD CONSUMPTION OF THE AVERAGE AMERICAN PER YEAR



Total consumption = 1,840 pounds per person

Based on the circle graph, how many pounds of milk and eggs does the average American consume each year?

- E.** 300
- F.** 368
- G.** 460
- H.** 552

95. Out of 2,000 high school seniors, 191 were enrolled in the Honor Society. What percentage of the entire group of 2,000 seniors were in the Honor Society?

A. 0.955%
B. 1.91%
C. 9.55%
D. 19.1%

96.

NUMBER OF VISITORS TO
BROOKSIDE ZOO

	Male	Female
Children	360	340
Adults	210	290

The table above shows the number of people who visited Brookside Zoo in one day. The largest of the four groups made up what percentage of all visitors on that day?

E. 30%
F. 28%
G. 24%
H. 17%

97. A bag contains 40 tiles that are either red, green, or blue. A tile is selected at random, the color is recorded, and the tile is put back in the bag. This process is carried out 120 times, and 18 of those times a red tile is selected. Based on the information, what is the most likely number of red tiles in the bag?

A. 6
B. 15
C. 18
D. 30

98.

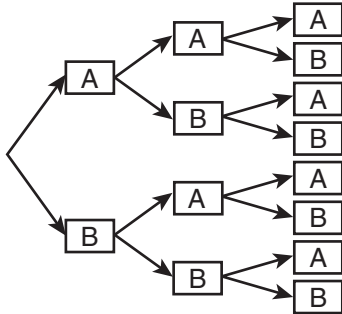
LAST YEAR'S TOTAL ATTENDANCE

Attendees	Number
Children	1,750
Adults	2,250
Seniors	1,000
Total	5,000

If 100 individuals will attend the museum next week, what is the best estimate (based on last year's attendance) of the number of children who will be in that group?

E. 30
F. 34
G. 35
H. 50

99. A teacher will randomly select 3 students to be on a school committee. He will choose either a student from Classroom A or a student from Classroom B with each selection. This tree diagram shows the selection possibilities.



101.

Report	Subject	Topic Choices
#1	Geography	Kenya, Thailand, Chile, Greece, New Zealand
#2	English	R. Frost, L. Hughes, N. Giovanni
#3	Science	1997 Mars mission
#4	Math	π , regular polyhedrons

Anita is assigned to report on 1 topic in each of the 4 subjects shown in the table above. How many different sets of 4 reports are possible, according to the choices available to her?

- A.** 10
- B.** 24
- C.** 30
- D.** 44

102. A deck of 52 playing cards contains 13 hearts. Sara has 12 cards from this deck in her hand, 3 of which are hearts. The other cards remain in the deck. What is the probability that a card drawn at random from the remainder of the deck will be a heart?

E. $\frac{1}{10}$

F. $\frac{1}{4}$

G. $\frac{3}{13}$

H. $\frac{1}{3}$

- 103.** The table shows the probability of randomly picking each flavor of candy from a bowl.

PICKING CANDY FROM
A BOWL

Flavor	Probability
Butterscotch	0.57
Lemon	0.095
Maple	0.125
Strawberry	0.21

Which flavor is most likely to be randomly picked?

- A.** butterscotch
- B.** lemon
- C.** maple
- D.** strawberry

- 104.** This formula can be used to determine p , the number of pages that will be in a book that contains w words, with an average of r words per page, and f extra pages in the front for the title and publishing information.

$$p = \frac{1}{r}w + f$$

If the formula is solved for w , it can be used to find the number of words in a book with p pages. What will the formula be if it is solved for w ?

E. $w = r(p - f)$

F. $w = \frac{1}{r}p + f$

G. $w = f + rp$

H. $w = r + p + f$

105. A shipment contains 170 small boxes of medical supplies. In a random sample of 20 of these boxes, 8 have damage and the others are undamaged. Based on this sample, what is the best prediction of the number of undamaged boxes in the shipment, **not** including the boxes in the random sample?

- A.** 60
- B.** 68
- C.** 90
- D.** 102

106. In basketball, a player can earn 1 point for making a free throw and 2 points for making another basket. Marcus makes a mean of 8 free throws per game, and he scores a total of at least 25 points per game. The inequality below shows this relationship, where b represents the number of 2-point baskets Marcus makes.

$$2b + 8 \geq 25$$

What is the number of 2-point baskets Marcus needs to make if he wants to score at least his minimum total points for a game and make his mean number of free throws?

- E.** $b \leq 8$
- F.** $b \geq 9$
- G.** $b \geq 16$
- H.** $b \leq 25$

- 107.** Nadia paid \$1.00 to mail a letter. The cost to mail a letter is \$0.55 for the first ounce of weight plus \$0.15 for each additional ounce. What was the weight, in ounces, of the letter Nadia mailed?

A. 1.4
B. 1.5
C. 3
D. 4

108.

COST OF ORANGES

Number of Oranges	Cost
4	\$1.80
6	\$2.70
9	\$4.05

The table shows the cost of oranges. What is the unit rate for the cost per orange?

E. \$0.45
F. \$0.90
G. \$1.35
H. \$1.80

- 109.** A softball player bought bottles of water for her team to have at practice. The total number of bottles she bought, b , is proportional to n , the number of players at practice. Which equation represents the relationship between b and n ? The constant of proportionality is p .

A. $b = pn$
B. $b = p + n$
C. $b + n = p$
D. $b + n + p = 1$

- 110.** Malik earns \$10 per hour at his job. He wants to change to a job that will pay \$12 per hour. What will be the percent increase in Malik's hourly pay if he makes this job change?

E. 2%
F. 20%
G. 83%
H. 120%

111. A rain gauge shows that 10 centimeters of rain fell yesterday. If 1 inch is equal to approximately 2.5 centimeters, about how many inches of rain fell yesterday?

- A.** 1
- B.** 2.5
- C.** 4
- D.** 10

112. The height of a plant, in millimeters, is proportional to the number of days the plant has grown. The plant has grown 20 millimeters in 8 days. What is the constant of proportionality, in millimeters per day?

- E.** 0.4
- F.** 2.5
- G.** 12
- H.** 20

113. Which table shows a proportional relationship?

A.

x	y
0	0
4	$\frac{3}{2}$
8	3

B.

x	y
0	1
4	$\frac{7}{2}$
8	6

C.

x	y
0	-1
4	$-\frac{1}{2}$
8	0

D.

x	y
0	0
4	12
8	16

114. Terry wants to pour cement around the edge of the circular patio in her backyard. The patio has a radius of 5 feet. What is the distance, in feet, around the edge of the patio? Use 3.14 for π .

E. 15.7

F. 31.4

G. 49.3

H. 78.5

THIS IS THE END OF THE TEST.
IF TIME REMAINS, YOU SHOULD CHECK
YOUR ANSWERS. BE SURE THAT THERE
ARE NO STRAY MARKS, PARTIALLY
FILLED ANSWER CIRCLES, OR
INCOMPLETE ERASURES ON YOUR
ANSWER SHEET. ■