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. How many 5-digit numbers can be created using the digits 2, 3, 5, 7, and 8 without repeating any digits within that 5-digit number?

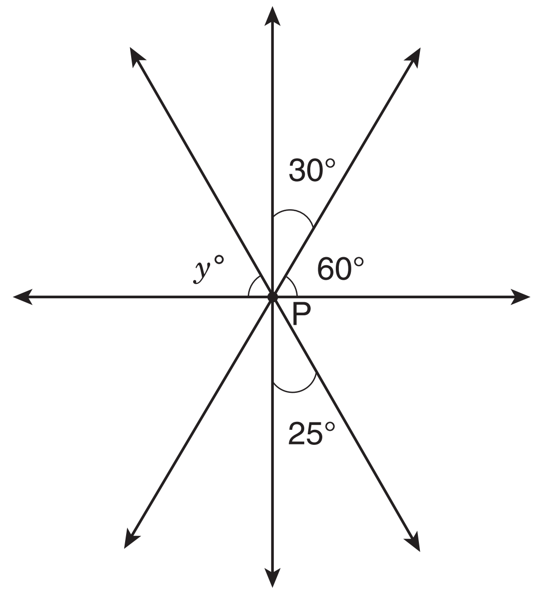
59. $$\frac{147 - x}{12} = 12$$

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

60. $\left|\left(-6\right) - \left(-5\right) + 4.2\right| - \left|3 - 9.6\right| =$

61. Tyler has completed 60 pages in his French workbook. This is 20% of the total number of pages in the workbook. How many pages are in the workbook?

62.



Four straight lines intersect at point P as shown above. What is the value of y?

Multiple Choice Questions

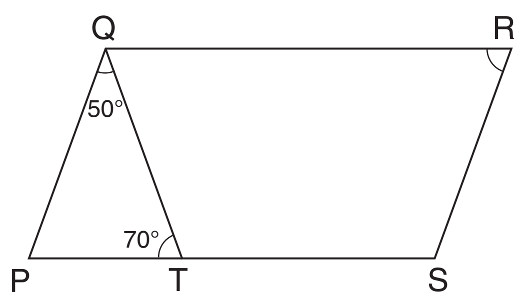
Questions 63–114

DIRECTIONS: Solve each problem. Select the best 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. If $x = 9$ and $y = -7$, what is the value of $x(x - 2y)$?

A. 18
B. 45
C. 144
D. 207

64.



In the figure above, PQRS is a parallelogram. The measure of $\angle PQT$ is 50°, and the measure of $\angle PTQ$ is 70°. What is the measure of $\angle QRS$?

E. 60°
F. 70°
G. 80°
H. 120°

65. $$M = 3N = \frac{P}{4} = Q + 5 = \frac{R}{7} > 0$$

Based on the statement above, which variable has the **greatest** value?

A. *M*
B. *N*
C. *P*
D. *R*

66.

DESSERT CHOICES

Dessert	Number of Times Ordered
Cookies	42
Pie	23
Cake	47
Ice Cream	48

The table above shows the number of times that different desserts were ordered at a restaurant. Based on this information, what is the probability of a customer ordering ice cream as a dessert?

E. 25%
F. 30%
G. 40%
H. 48%

67. To make party invitations, Macie could buy a package of paper for $10.50, or she could buy x individual sheets of the same paper for $0.15 each. What is the largest value of x that would make buying the individual sheets **less** expensive than buying the package?

A. 60
B. 65
C. 69
D. 70

68. At 1:00 p.m. one day, the temperature was 8 degrees above zero. During the rest of the day, the temperature fell 3 degrees per hour. What was the temperature at 7:00 p.m. that day?

E. $-13°$
F. $-10°$
G. $-7°$
H. $5°$

69. A bag contains 75 marbles that are red, blue, or green. The ratio of red to blue marbles is 15:7, and the ratio of blue to green marbles is 7:3. If 2 blue marbles are removed and replaced with 2 green marbles, what will be the new ratio of red to green marbles?

A. 3:1
B. 5:1
C. 15:3
D. 45:11

70. A roofing contractor uses shingles at a rate of 3 bundles for every 96 square feet of roof covered. At this rate, how many bundles of shingles will he need in order to cover a roof that is 416 square feet?

E. 5
F. 12
G. 13
H. 14

71. What is the least common multiple of 24, 6, and 18?

A. 36
B. 48
C. 72
D. 144

72. One day, the Early Bird Restaurant used 15 dozen eggs for 200 breakfast customers. At this rate, approximately how many dozen eggs are needed for 300 breakfast customers?

E. 20
F. 23
G. 25
H. 30

73. A cooler contains three types of beverages:
5 bottles of apple juice, 3 bottles of grape juice, and 6 bottles of orange juice. What is the probability that a bottle chosen at random from this cooler is **not** apple juice?

A. $\frac{1}{9}$
B. $\frac{5}{14}$
C. $\frac{9}{14}$
D. $\frac{2}{3}$

74. A large circular dinner plate has a radius of 20 centimeters. A smaller circular plate with a circumference of 20π centimeters is placed in the center of the larger dinner plate. What is the area of the part of the larger dinner plate that is not covered by the smaller plate?

E. 20π sq cm
F. 100π sq cm
G. 200π sq cm
H. 300π sq cm

75.

PRICES FOR NEWSPAPER ADVERTISING

Page Space	Price
$\frac{1}{4}$ page	$200
$\frac{1}{2}$ page	$350
full page	$600

The table above shows prices for newspaper advertising. A store purchased $\frac{1}{4}$ pages, $\frac{1}{2}$ pages, and full pages of page space in equal numbers for a total of $11,500. What is the total amount of page space the store purchased?

A. $1\frac{3}{4}$ pages

B. 10 pages

C. $16\frac{1}{2}$ pages

D. $17\frac{1}{2}$ pages

76. How many positive odd numbers satisfy the inequality $3x + 8 \leq 92$?

E. 13

F. 14

G. 17

H. 28

77. If $\frac{36}{y} = 4x$, what is the value of x when $y = 3$?

A. 3

B. 4

C. 9

D. 12

78. Points X , Y , and Z are on a straight line, and Y is between X and Z . Length $\overline{YZ} = \frac{3}{5}\overline{XY}$, and length $\overline{XY} = 20$ centimeters. What is the length of $\overline{XZ}$?

E. 12 cm

F. 24 cm

G. 30 cm

H. 32 cm

79. Bryana bought $1\frac{3}{4}$ yards of cloth at $8.00 per yard. If there was an 8% sales tax, what was the total cost of the cloth?

A. $12.96

B. $14.08

C. $15.12

D. $16.08

80.

On the number line above, $MN = 5\frac{5}{6}$.
What is the position of point M?

E. $-7\frac{1}{6}$

F. $-4\frac{1}{2}$

G. $4\frac{1}{2}$

H. $7\frac{1}{6}$

81. A United States presidential coin is made from an alloy of four metals—copper, zinc, manganese, and nickel—with weights in the ratio of 177:12:7:4, respectively. The coin weighs a total of 8 grams. What is the weight of the zinc in this coin?

A. 0.28 g

B. 0.48 g

C. 0.96 g

D. 48 g

82. Jack scored a mean of 15 points per game in his first 3 basketball games. In his 4th game, he scored 27 points. What is his mean score for the first 4 games?

E. 15

F. 17

G. 18

H. 21

83. A cylindrical oil drum can hold 4,320 liters when it is completely full. Currently, the drum is $\frac{1}{3}$ full of oil. How many **kiloliters** of oil need to be added in order to fill the drum completely?

A. 1.44

B. 2.88

C. 4.32

D. 14.10

84. Nicole's age now is three times Carmen's age. If Carmen will be 17 in two years, how old was Nicole 5 years ago?

E. 38 yr

F. 40 yr

G. 45 yr

H. 50 yr

85. A chemical decays in such a way that the amount left at the end of each week is 20% less than the amount at the beginning of that same week. What percent of the original amount is left after two weeks?

A. 40%

B. 60%

C. 64%

D. 80%

86. If $w - 1$ is an odd integer, which one of the following **must** be an even integer?

E. $w + 1$

F. $2w - 1$

G. $2w - 2$

H. $2w + 1$

87. Three students stand at the starting line of a running track and begin running laps at the same time. Ann completes 1 lap every 2 minutes, Jack completes 1 lap every 3 minutes, and Lee completes 1 lap every 4 minutes. How many laps does Ann complete before all three runners are once again at the starting line at the same time?

A. 4

B. 6

C. 12

D. 20

88. Simplify this expression:

$$4(7-3x)-(5-x)$$

E. $23-4x$

F. $23-11x$

G. $28-4x$

H. $28-12x$

89.

PET SURVEY

Number of Pets	Number of Students
0	12
1	16
2	7
3 or more	5

Amy surveyed students at her school about the number of pets they have. What is the probability that a student who participated in the survey has at least 2 pets?

A. $\frac{7}{40}$

B. $\frac{1}{12}$

C. $\frac{1}{8}$

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

90. A large container is partially filled with n liters of water. Ito adds 10 liters of water to the container, making it 60% full. If Ignacio adds 6 more liters of water, the container will be 75% full. What is the value of n?

E. 14

F. 15

G. 26

H. 30

91.

$$5x^3+3x+9+\frac{1}{x^2}$$

If $x=10$, what is the value of the expression above?

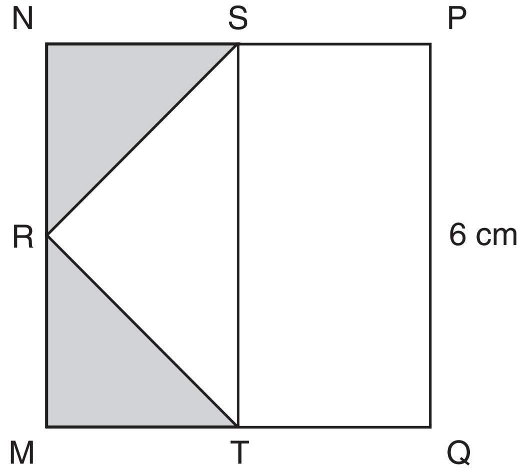
A. 2,539.01

B. 5,039.01

C. 5,039.1

D. 5,139

92.



R, S, and T are midpoints of the sides of square MNPQ, as shown above. What is the sum of the areas of the shaded triangles?

E. 9 sq cm
F. 12 sq cm
G. 18 sq cm
H. 36 sq cm

93. The Chens spend \$5 of every \$8 they earn on planned expenses. If the family earns \$29,600 in one year, how much will they spend on planned expenses that year?

A. \$1,850
B. \$3,700
C. \$5,920
D. \$18,500

94. A pizza shop offers a choice of 3 sizes (small, medium, and large) and 7 different toppings. Different pizzas can be created by changing the size and/or the choice of toppings. If Cody wants to order a pizza with exactly 2 different toppings, how many different pizzas can he create?

E. 6
F. 21
G. 63
H. 126

95.

SURVEY OF CATS PER FAMILY

Number of Cats	Number of Families
0	15
1	42
2	35
3 or more	8

The table above shows the number of cats per family in 100 households in the Blaine neighborhood. By what **percentage** is the number of families with 1 cat greater than the number of families with 2 cats?

A. 7%
B. 10%
C. 17%
D. 20%

96. A wooden box has a square base. The height of this box is 3 times the length of one side of the base. If one side of the base is 3 feet long, what is the volume of this box?

E. 9 cu ft
F. 27 cu ft
G. 36 cu ft
H. 81 cu ft

97. On a bike trip, Rajiv traveled 65 kilometers in 5 hours, while Shaina traveled 72 kilometers in 4 hours. How much **less** was Rajiv's mean speed, in kilometers per hour (kph), than Shaina's?

A. 1
B. 5
C. 7
D. 9

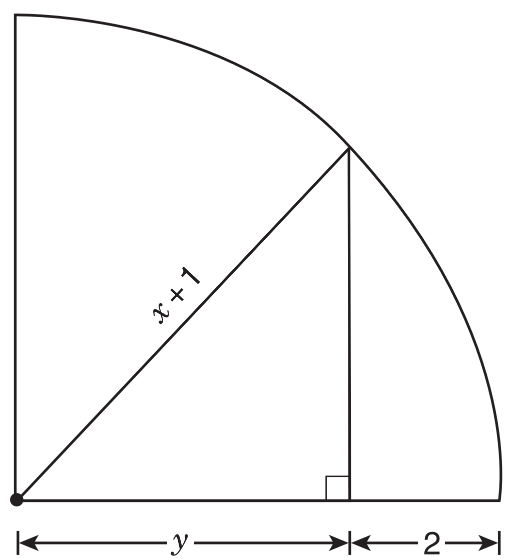
98. Points P, Q, R, and S represent $^{-}3$, $^{-}1$, 0, and 2, respectively, on a number line. How many units is the midpoint of $\overline{PQ}$ from the midpoint of $\overline{RS}$?

E. 1
F. 2
G. 3
H. 4

99. There are 1,000 cubic centimeters in 1 liter, and 1,000 cubic millimeters in 1 milliliter. How many cubic millimeters are there in 1,000 cubic centimeters?

A. 1,000
B. 10,000
C. 100,000
D. 1,000,000

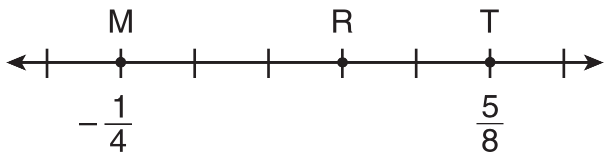
100.



In the quarter circle above, what is y in terms of x?

E. $x - 1$
F. $x + 1$
G. $\frac{x+1}{2}$
H. $\sqrt{\frac{(x+1)^2}{2}}$

101.



The hash marks on the number line above are evenly spaced. What is the coordinate of point R?

A. $\frac{7}{40}$

B. $\frac{9}{40}$

C. $\frac{11}{40}$

D. $\frac{21}{40}$

102. Phan chose an Internet service that charges \$18.00 per month plus \$0.024 per minute. Deion chose an Internet service that charges \$30.00 per month for unlimited usage. At the end of the month, Phan's and Deion's charges were identical. For how many minutes did Phan use the Internet service that month?

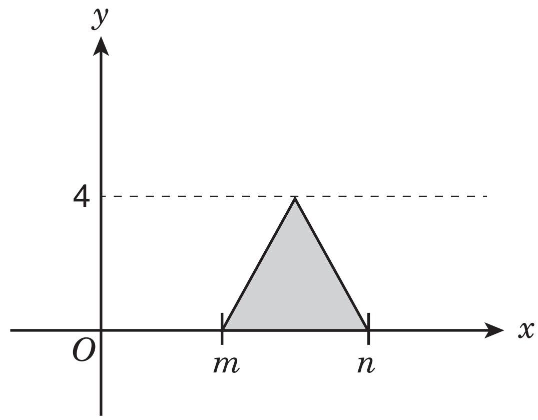
E. 50

F. 60

G. 100

H. 500

103.



What is the area of the shaded triangle shown above?

A. $m + n$

B. $n - m$

C. $2(n - m)$

D. $4(n - m)$

104. The decimal 0.06 can be written as the fraction $\frac{x}{50}$. What is the value of x?

E. 3

F. 6

G. 12

H. 30

105. In a sample of 50 cars at a local dealership, there are 12 red cars and 10 cars with backup cameras. Of the 12 red cars, 4 have backup cameras. If a car is selected at random from the given sample, what is the probability that **both** of the following are true: the car is **not** red and does **not** have a backup camera?

A. $\frac{3}{5}$

B. $\frac{16}{25}$

C. $\frac{19}{25}$

D. $\frac{4}{5}$

106.

ANIMAL CARDS

Number of Cards	Picture on Card
8	cat
6	dog
5	bird
4	fish
1	horse

The cards in the table above are mixed in a box. Which animal pictured on a card has exactly a 1 in 4 chance of being picked at random from the box?

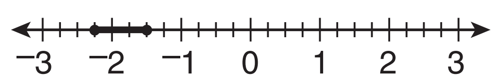
E. cat

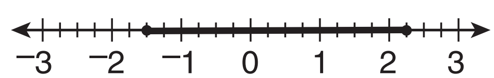
F. dog

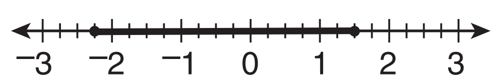
G. fish

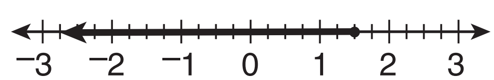
H. horse

107. Which number line below shows the solution set for $2x - 2 \le y \le 4x + 10$ when $y = 1$?

A. 

B. 

C. 

D. 

108. $$\frac{14}{21} = \frac{p}{7}$$

In the equation above, what is the value of p?

E. $\frac{2}{3}$

F. 3

G. $\frac{14}{3}$

H. 14

109. A ball is selected at random from a box that contains 7 black balls, 14 green balls, and 21 red balls. What is the probability that the ball selected is black?

A. $\frac{1}{6}$

B. $\frac{1}{5}$

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

D. $\frac{5}{6}$

110. At North High School, a survey asked two questions, Question A and Question B. For each question, students could answer either "yes" or "no." Of the 800 students who responded to the survey, 720 answered "yes" to Question A, and 640 answered "yes" to Question B. What is the **least** possible number of these students who could have answered "yes" to **both** questions?

E. 80

F. 160

G. 560

H. 640

111. Raoul is at least 3 years older than Vahn. Which of the following inequalities gives the relationship between Raoul's age (r) and Vahn's age (v)?

A. $r - v \geq 3$

B. $r - v \leq 3$

C. $3 - v \leq r$

D. $3 - r \leq v$

112. 1 sind = 5.6 ricks

1 sind = 12.88 dalts

Using the conversion above, how many dalts are equal to 1 rick?

E. 0.43
F. 2.30
G. 7.28
H. 18.48

113. There are now x cans stacked on a shelf that holds 36 cans when full. If 4 of these cans were removed, the shelf would be half full. What is the value of x ?

A. 14
B. 16
C. 18
D. 22

114. Carlos tossed a paper cup in the air 50 times and found that the probability of it landing on its side was 72%. If he tosses the cup in the air 150 **more** times, what is the total number of times he can expect the cup to land on its side?

E. 72
F. 108
G. 144
H. 158

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. ■