

# PART 2 — MATHEMATICS

57 QUESTIONS

## IMPORTANT NOTES

- (1) Formulas and definitions of mathematical terms and symbols are **not** provided.
  - (2) Diagrams other than graphs are **not** necessarily drawn to scale. Do not assume any relationship in a diagram unless it is specifically stated or can be determined from the information given.
  - (3) Assume that a diagram is in one plane unless the question specifically states that it is not.
  - (4) Graphs are drawn to scale. Unless stated otherwise, you can assume relationships according to appearance. For example, lines on a graph that appear to be parallel can be assumed to be parallel. This is also true for concurrent lines, straight lines, collinear points, right angles, etc.
  - (5) Reduce (simplify) all fractions to lowest terms.
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CONTINUE ON TO THE NEXT PAGE ►

# GRID-IN QUESTIONS

## QUESTIONS 58–62

**DIRECTIONS:** Solve each question. 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. Ms. Li opened a retirement account with a deposit of \$2,500. This account earns 4% simple interest annually. How many years will it take her to earn \$500 on her \$2,500 deposit?

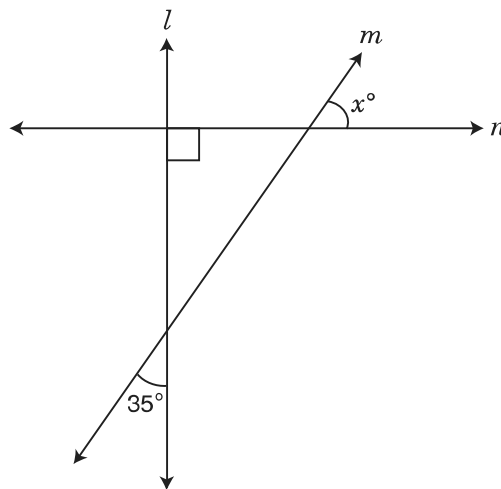
59.  $6 - 9 \div |-3| + (-2)^3 \times 1\frac{1}{2}$

What is the value of the expression shown above?

60. Solve for  $x$ :

$$7x + 3 - 2(2x + 1) = 13$$

- 61.



In the figure above, line  $l$  is perpendicular to line  $n$ . What is the value of  $x$ ?

62. The mean value of 8 numbers is 17. Three of these numbers (9, 11, and 20) are discarded. What is the mean of the 5 remaining numbers?

# MULTIPLE CHOICE QUESTIONS

## QUESTIONS 63–114

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

63.  $3^4 + 7^4 =$

- A. 40
- B. 370
- C. 2,482
- D. 10,000

64. In one week,  $1\frac{3}{4}$  inches of rain fell on Monday,  $2\frac{2}{3}$  inches fell on Tuesday, and  $\frac{7}{8}$  inch fell on Wednesday. How many inches of rain fell during those three days?

- E.  $5\frac{7}{24}$
- F.  $5\frac{1}{24}$
- G.  $3\frac{4}{5}$
- H.  $3\frac{1}{2}$

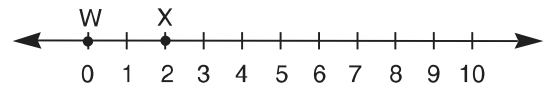
65. An alarm bell will ring when the pressurized gas in a cylinder reaches an internal pressure that is 215% of the maximum allowable pressure. If the maximum allowable pressure is 220 pounds per square inch, at what pressure, in pounds per square inch, will the alarm bell ring?

- A. 235
- B. 435
- C. 473
- D. 583

66. A revolving sign makes 1 complete revolution every 90 minutes. If the sign starts moving at 2:30 p.m., at what time will the sign complete 8 revolutions?

- E. 1:00 a.m.
- F. 2:30 a.m.
- G. 4:00 p.m.
- H. 12:00 midnight

67.



Points Y and Z are not shown on the number line above. If X is the midpoint of  $\overline{WY}$ , and Y is the midpoint of  $\overline{WZ}$ , where on the number line would point Z be located?

- A. 2
- B. 4
- C. 6
- D. 8

68.

$$\frac{81}{10} = \frac{9}{n}$$

What value of  $n$  makes the equation above true?

E. 1

F.  $1\frac{1}{9}$

G. 5

H.  $10\frac{1}{9}$

69. If  $n$  is an integer and  $3n + 3$  is an even number, which expression must also represent an even number?

A.  $5n + 1$

B.  $4n + 5$

C.  $2n + 3$

D.  $n + 2$

70. The product of two positive integers is 65. Which number could be the sum of the two integers?

E. 5

F. 18

G. 24

H. 52

71. If  $n$  is an odd integer that is less than  $-3.25$ , what is the **greatest** possible value of  $n$ ?

A.  $-1$

B.  $-2$

C.  $-3$

D.  $-5$

72. Mikah's history assignment is to read 420 pages. He planned to do the assignment in 6 hours. He read the first 160 pages in 2 hours. What is the mean number of pages he must read per hour during the next 4 hours in order to complete the assignment according to plan?

E. 60

F. 65

G. 70

H. 75

73. Between which two consecutive integers is the fraction  $\frac{29}{7}$ ?

A. 2 and 3

B. 3 and 4

C. 4 and 5

D. 5 and 6

74.

## DOWNTOWN BUILDING CONDITIONS

Condition	Number of Buildings	Percentage of Total
Excellent	78	33.6%
Good	69	29.7%
Fair	70	30.2%
Poor	11	6.7%
Dilapidated	4	1.7%
<b>Total</b>	<b>232</b>	<b>99.9%</b>

One number in the percentage column is incorrect. Which change needs to be made?

- E. Change "Excellent" to 36.6%.
- F. Change "Good" to 32.7%.
- G. Change "Fair" to 33.2%.
- H. Change "Poor" to 4.7%.

75. Joseph is 5 feet 9 inches tall, and Roberto is 6 feet 4.5 inches tall. What is the difference in height, in inches, between Roberto and Joseph?

- A. 4.5
- B. 5.5
- C. 6.5
- D. 7.5

76.

$$x:35 = 20:28$$

For what value of  $x$  is the proportion shown above true?

- E. 27
- F. 25
- G. 16
- H. 13

77.

$$\frac{3^2 + (-8)^2 + 2^2}{(3 - 8 + 2)^2} =$$

- A. -60
- B.  $-\frac{17}{3}$
- C.  $\frac{77}{9}$
- D. 68

78. Anya contributed \$1,200 toward the purchase of a \$2,000 computer. Her brother contributed \$240 toward the same computer. Her parents provided the rest of the money for the computer. What percentage of the total cost of the computer did Anya's parents pay?

- E. 24%
- F. 28%
- G. 32%
- H. 36%

79. The numbers  $m$ ,  $n$ ,  $p$ , and  $q$  are different, and each is equal to one of the numbers 1, 2, 3, 6, or 12. If  $2m = 6q = \frac{1}{2}n = p$ , what is the value of  $p$ ?

- A. 2
- B. 3
- C. 6
- D. 12

80.  $\{0.1, 0.01, 0.001, 0.0001, 0.00001\}$

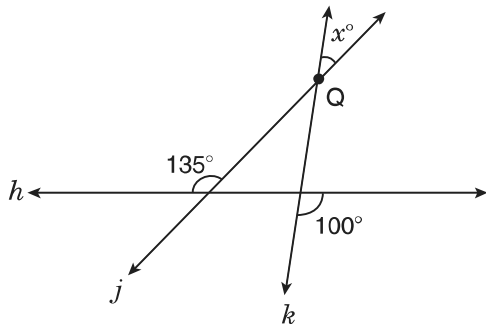
If a person chooses a number at random from the set above, what is the probability that the number is less than 0.005?

- E.  $\frac{1}{5}$   
F.  $\frac{2}{5}$   
G.  $\frac{3}{5}$   
H.  $\frac{2}{3}$

81. Lemont answered 6 out of 40 questions on a test incorrectly. What percentage of the questions did he answer correctly?

- A. 85%  
B. 67%  
C. 34%  
D. 15%

- 82.



Lines  $j$  and  $k$  intersect at point  $Q$ , and  $h$  is a straight line. What is the value of  $x$ ?

- E. 55  
F. 45  
G. 35  
H. 30

83. Which statement **must** be true if  $x$  is a whole number greater than or equal to 1?

- A.  $\frac{1}{x+1} > \frac{1}{x+2}$   
B.  $\frac{1}{x+1} < \frac{1}{x+2}$   
C.  $\frac{1}{x+1} - \frac{1}{x+2} > 1$   
D.  $\frac{1}{x+1} - \frac{1}{x+2} > \frac{1}{x}$

84. A basket contains red balls, green balls, and white balls. There are 12 red balls in the basket. The probability of randomly choosing a red ball is 1 in 3. If the probability of randomly choosing a green ball is 1 in 4, how many green balls are in the basket?

- E. 3  
F. 8  
G. 9  
H. 16

85. It took Lars 2 hours to ride his bicycle 48 kilometers. What was his average speed in **miles per hour**? (Use the approximation 1 mile = 1.6 kilometers.)

- A. 1.5  
B. 15.0  
C. 30.0  
D. 38.4

86. Integer  $x$  is evenly divisible by 3. Which expression below is also evenly divisible by 3?

- E.  $2x + 1$   
F.  $3x - 5$   
G.  $4x - 1$   
H.  $4x + 6$