SECTION 6

Time — 25 minutes
18 Questions

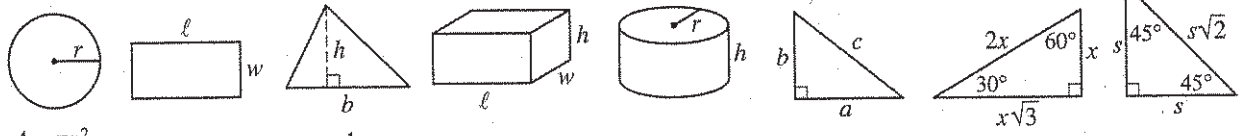
Turn to Section 6 (page 6) of your answer sheet to answer the questions in this section.

Directions: This section contains two types of questions. You have 25 minutes to complete both types. For questions 1-8, solve each problem and decide which is the best of the choices given. Fill in the corresponding circle on the answer sheet. You may use any available space for scratchwork.

Notes

1. The use of a calculator is permitted.
2. All numbers used are real numbers.
3. Figures that accompany problems in this test are intended to provide information useful in solving the problems. They are drawn as accurately as possible EXCEPT when it is stated in a specific problem that the figure is not drawn to scale. All figures lie in a plane unless otherwise indicated.
4. Unless otherwise specified, the domain of any function f is assumed to be the set of all real numbers x for which $f(x)$ is a real number.

Reference Information



$A = \pi r^2$
$C = 2\pi r$

$A = \ell w$

$A = \frac{1}{2}bh$

$V = \ell wh$

$V = \pi r^2 h$

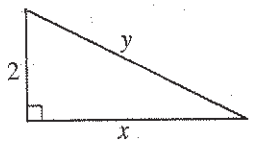
$c^2 = a^2 + b^2$

Special Right Triangles

The number of degrees of arc in a circle is 360.
The sum of the measures in degrees of the angles of a triangle is 180.

1. If $x + \frac{2}{x} = 5 + \frac{2}{5}$, then x can equal which of the following?

(A) $\frac{1}{5}$
(B) $\frac{4}{5}$
(C) 1
(D) $\frac{5}{2}$
(E) 5



Note: Figure not drawn to scale.

2. In the right triangle above, if $x = 3$, what is the value of y?

(A) $\sqrt{13}$ (approximately 3.61)
(B) $\sqrt{15}$ (approximately 3.87)
(C) 4
(D) $\sqrt{17}$ (approximately 4.12)
(E) 5

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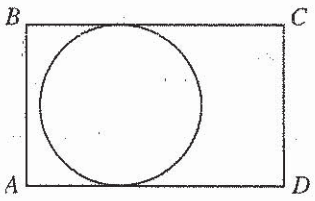
All numbers that are divisible by both 2 and 6 are also divisible by 4.

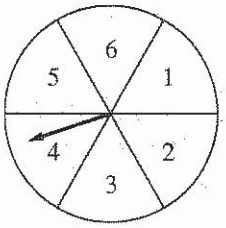
3. Which of the following numbers can be used to show that the statement above is FALSE?

(A) 4
(B) 8
(C) 12
(D) 18
(E) 24



4. In the figure above, the circle is tangent to sides BC and AD of the 8-by-12 rectangle, $ABCD$. What is the area of the circle?

(A) 16π
(B) 20π
(C) 36π
(D) 64π
(E) 96π



5. On the disk shown above, a player spins the arrow twice. The fraction $\frac{a}{b}$ is formed, where a is the number of the sector where the arrow stops after the first spin and b is the number of the sector where the arrow stops after the second spin. On every spin, each of the numbered sectors has an equal probability of being the sector on which the arrow stops. What is the probability that the fraction $\frac{a}{b}$ is greater than 1 ?

(A) $\frac{15}{36}$
(B) $\frac{16}{36}$
(C) $\frac{18}{36}$
(D) $\frac{20}{36}$
(E) $\frac{21}{36}$

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6. Which of the following tables shows a relationship in which w is directly proportional to x ?

(A)

w	x
1	3
2	4
3	5

(B)

w	x
3	9
4	16
5	25

(C)

w	x
5	10
6	18
7	28

(D)

w	x
7	21
8	24
9	27

(E)

w	x
5	10
10	15
15	20

7. Dwayne has a newspaper route for which he collects k dollars each day. From this amount he pays out $\frac{k}{3}$ dollars per day for the cost of the papers, and he saves the rest of the money. In terms of k, how many days will it take Dwayne to save \$1,000 ?

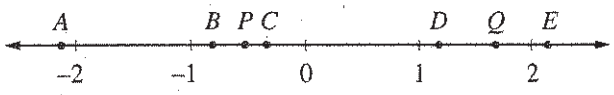
(A) $\frac{k}{1{,}500}$

(B) $\frac{k}{1{,}000}$

(C) $\frac{1{,}000}{k}$

(D) $\frac{1{,}500}{k}$

(E) $1{,}500k$



8. Which of the lettered points on the number line above could represent the result when the coordinate of point P is multiplied by the coordinate of point Q ?

(A) A
(B) B
(C) C
(D) D
(E) E

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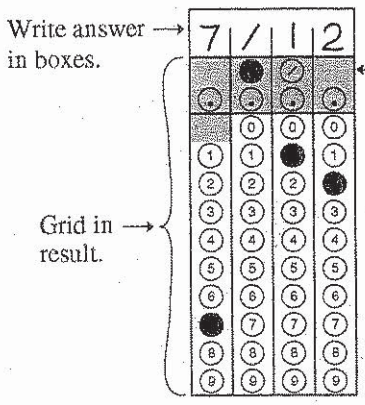
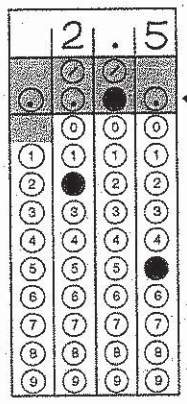
Directions: For Student-Produced Response questions 9-18, use the grids at the bottom of the answer sheet page on which you have answered questions 1-8.

Each of the remaining 10 questions requires you to solve the problem and enter your answer by marking the circles in the special grid, as shown in the examples below. You may use any available space for scratchwork.

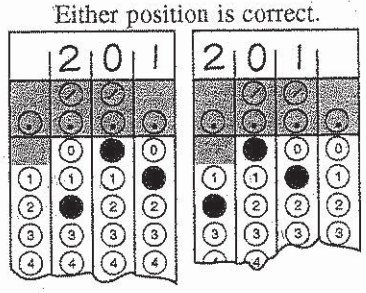
Answer: $\frac{7}{12}$



Answer: 2.5



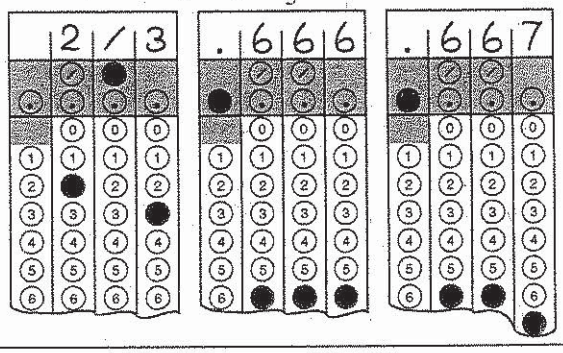
Answer: 201
Either position is correct.



Note: You may start your answers in any column, space permitting. Columns not needed should be left blank.

- Mark no more than one circle in any column.
- Because the answer sheet will be machine-scored, **you will receive credit only if the circles are filled in correctly.**
- Although not required, it is suggested that you write your answer in the boxes at the top of the columns to help you fill in the circles accurately.
- Some problems may have more than one correct answer. In such cases, grid only one answer.
- No question has a negative answer.
- **Mixed numbers** such as $3\frac{1}{2}$ must be gridded as 3.5 or 7/2. (If 3 1/2 is gridded, it will be interpreted as $\frac{31}{2}$, not $3\frac{1}{2}$.)
- **Decimal Answers:** If you obtain a decimal answer with more digits than the grid can accommodate, it may be either rounded or truncated, but it must fill the entire grid. For example, if you obtain an answer such as 0.6666..., you should record your result as .666 or .667. **A less accurate value such as .66 or .67 will be scored as incorrect.**

Acceptable ways to grid $\frac{2}{3}$ are:



9. If $5y + 2x = 23$ and $x = y + 1$, what is the value of y?

10. A company produced 300 appliances in the first week of the month. Because it received additional machinery, its production increased 50 percent from the first week to the second week. How many appliances did the company produce the second week?

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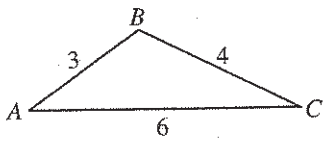
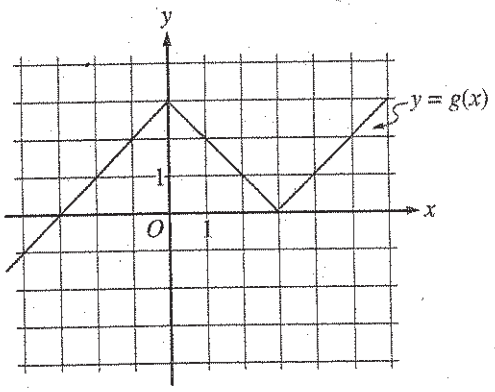


11. Each angle of $\triangle ABC$ above has the same measure as an angle in $\triangle XYZ$ (not shown). If the length of one side of $\triangle XYZ$ is 24, what is one possible perimeter of $\triangle XYZ$?

12. The sum of 5 consecutive integers is 1,000. What is the value of the greatest of these integers?



13. The figure above shows the graph of $y = g(x)$. If the function h is defined by $h(x) = g(2x) + 2$, what is the value of $h(1)$?

14. Exactly 4 actors try out for the 4 parts in a play. If each actor can perform any one part and no one will perform more than one part, how many different assignments of actors are possible?

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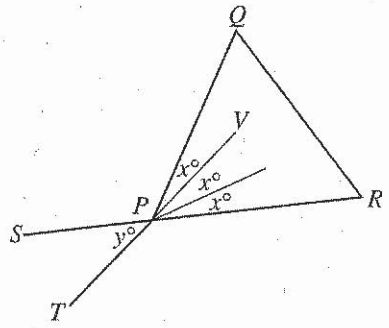

15. In the figure above, $\triangle PQR$ is equilateral and $\overline{SR}$ and $\overline{TV}$ intersect at point P. What is the value of y?

16. Let the operations $\triangle$ and $\square$ be defined for all real numbers a and b as follows.

$$a \triangle b = a + 3b$$

$$a \square b = a + 4b$$

If $4 \triangle (5y) = (5y) \square 4$, what is the value of y?

17. In the xy-coordinate plane, the graph of $x = y^2 - 4$ intersects line ℓ at $(0, p)$ and $(5, t)$. What is the greatest possible value of the slope of ℓ?

18. Esther drove to work in the morning at an average speed of 45 miles per hour. She returned home in the evening along the same route and averaged 30 miles per hour. If Esther spent a total of one hour commuting to and from work, how many miles did Esther drive to work in the morning?

STOP

If you finish before time is called, you may check your work on this section only. Do not turn to any other section in the test.