

SECTION 6

Time – 20 minutes

18 Questions

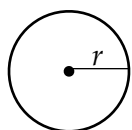
Turn to Section 5 of your answer sheet to answer the questions in this section.

Directions: For this section, 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 scratch work.

Notes

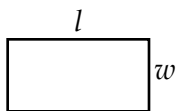
- The use of calculator is permitted.
- All numbers used are real numbers.
- Figures that accompany problems in this test are intended to provide information useful in solving the problems. They are drawn as accurately as possibly EXCEPT when it is stated in a specific problem that the figure is not drawn to scale. All figures lie in a plane unless otherwise indicated.
- 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

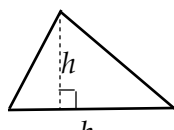


$$A = \pi \cdot r^2$$

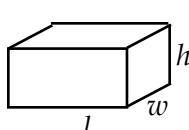
$$C = 2 \cdot \pi \cdot r$$



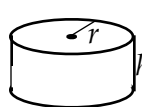
$$A = l \cdot w$$



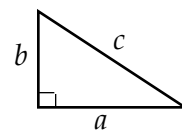
$$A = \frac{1}{2} b \cdot h$$



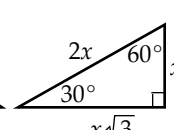
$$V = l \cdot w \cdot h$$



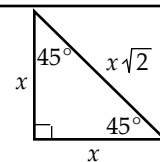
$$V = \pi \cdot r^2 \cdot h$$



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



Special Right Triangles



The number of degrees of arc in a circle is 360.

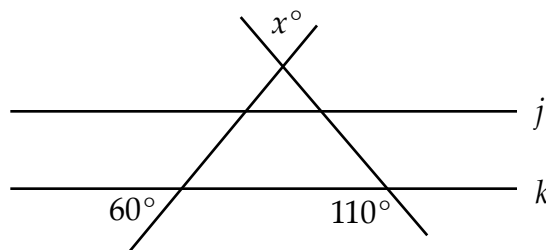
The sum of the measures in degrees of the angles of a triangle is 180.

1. Given that there are 12 inches in one foot and 3 feet in one yard, how many inches are in 3.5 yards?

- (A) 10.5
 (B) 42
 (C) 126
 (D) 300
 (E) 504

2. If $x(y - 3) = 2(z - 6)$, what is the value of z when $x = 2$ and $y = 6$?

- (A) 4
 (B) 5
 (C) 6
 (D) 9
 (E) 12



3. Given line j is parallel to line k , what is the value of x ?

- (A) 45
 (B) 50
 (C) 55
 (D) 60
 (E) 70

GO ON THE THE NEXT PAGE

4. What is the value of x if $\sqrt{x+10} = 1 + \sqrt{x}$?

- (A) 0
 - (B) $\frac{4}{9}$
 - (C) $\frac{9}{2}$
 - (D) $\frac{81}{4}$
 - (E) No real numbers
-

5. Which of the following expressions is equivalent to $8k^2$?

- (A) $\sqrt{8k^4}$
 - (B) $\sqrt{64k^2}$
 - (C) $2\sqrt{16k^4}$
 - (D) $2\sqrt{16k^2}$
 - (E) $4\sqrt{2k^4}$
-

6. A cell phone company offers two monthly plans to their customers. Plan A charges a base price of \$12.50, plus \$0.25 per phone call. Plan B charges a base price of \$7.50, plus \$0.75 per phone call. If Charlie chooses Plan B, which of the following statements represent the cost of Plan B, in dollars?

- (A) $7.5 + 0.75x$
- (B) $12.5 + 0.25x$
- (C) $20 + x$
- (D) $7,500 + 75x$
- (E) $12,500 + 25x$

7. If $3a = 5b$ and $7b = 3c$ then $\frac{a}{c} =$

- (A) $\frac{1}{35}$
 - (B) $\frac{5}{7}$
 - (C) $\frac{7}{5}$
 - (D) $\frac{9}{5}$
 - (E) 35
-

8. If $a + b = 24$ and $c + d = 21$ and $e + f = 27$, what is the arithmetic mean (average) of $a, b, c, d, e,$ and f ?

- (A) 6
- (B) 9
- (C) 12
- (D) 15
- (E) 24

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 scratch work.

Write answer in boxes →

Grid in results

Answer: $\frac{5}{13}$

5	/	1	3
○	●	○	○
○	○	○	○
①	①	●	①
②	②	②	②
③	③	③	●
④	④	④	④
●	⑤	⑤	⑤
⑥	⑥	⑥	⑥
⑦	⑦	⑦	⑦
⑧	⑧	⑧	⑧
⑨	⑨	⑨	⑨

← Fraction Line

Answer: 7.4

	7	.	4
○	○	○	○
○	○	○	○
①	①	①	①
②	②	②	②
③	③	③	③
④	④	④	●
⑤	⑤	⑤	⑤
⑥	⑥	⑥	⑥
⑦	●	⑦	⑦
⑧	⑧	⑧	⑧
⑨	⑨	⑨	⑨

← Decimal Line

Answer: 231
Either position is correct

2	3	1	
○	○	○	○
○	○	○	○
①	①	●	①
②	②	②	②
③	●	③	③
④	④	④	④

	2	3	1
○	○	○	○
○	○	○	○
①	①	①	●
②	②	②	②
③	③	●	③
④	④	④	④

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

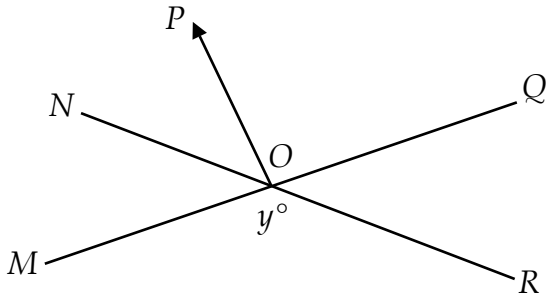
- Mark no more than one circle in any column.
 - Because the answer sheet will be machine-scored, **you will receive credit only if the circles are filled in correctly.**
 - Although not required, it is suggested that you write your answer in the boxes at the top of the columns to help you fill in the 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 $4\frac{1}{2}$ must be gridded as 4.5 or 9/2. (If

4	1	/	2
○	○	○	○

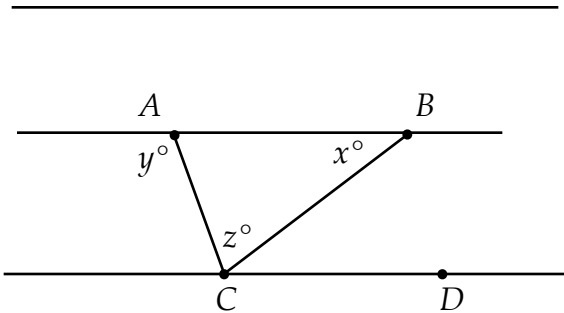
 is gridded, it will be interpreted as $\frac{41}{2}$, not $4\frac{1}{2}$.)
- **Decimal Answers:** If you obtain a decimal answer with more digits than the grid can accommodate, it may be either rounded or truncated, but it must fill the entire grid. For example, if you obtain an answer such as 0.6666..., 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:
- | | | | |
|---|---|---|---|
| | 2 | / | 3 |
| ○ | ○ | ○ | ○ |
| ○ | ○ | ○ | ○ |
| ① | ① | ① | ① |
| ② | ● | ② | ② |
| ③ | ③ | ③ | ● |
| ④ | ④ | ④ | ④ |
| ⑤ | ⑤ | ⑤ | ⑤ |
| ○ | ⑥ | ⑥ | ⑥ |
- | | | | |
|---|---|---|---|
| . | 6 | 6 | 6 |
| ○ | ○ | ○ | ○ |
| ○ | ○ | ○ | ○ |
| ① | ① | ① | ① |
| ② | ② | ② | ② |
| ③ | ③ | ③ | ③ |
| ④ | ④ | ④ | ④ |
| ⑤ | ⑤ | ⑤ | ⑤ |
| ⑥ | ● | ● | ● |
- | | | | |
|---|---|---|---|
| | 6 | 6 | 7 |
| ○ | ○ | ○ | ○ |
| ○ | ○ | ○ | ○ |
| ① | ① | ① | ① |
| ② | ② | ② | ② |
| ③ | ③ | ③ | ③ |
| ④ | ④ | ④ | ④ |
| ⑤ | ⑤ | ⑤ | ⑤ |
| ⑥ | ● | ● | ⑥ |

9. A neighborhood swimming pool holds 420 gallons of water. The pool is currently $\frac{6}{7}$ full. If the pool is filled with a water hose flowing at a rate of 2 gallons per minute, how many minutes will it take to fill the pool?

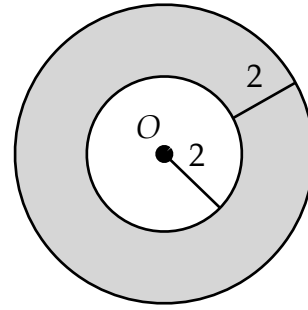
10. There are 5 courses offered by the art department at a local college. Jay must choose exactly 2 of them. How many different combinations of 2 courses are possible for Jay if there are no restrictions on which 2 courses he can choose?



11. In the figure above, NR and MQ intersect at point O . What is the value of $\angle POQ$ if $y = 150$ and ON bisects $\angle MOP$?

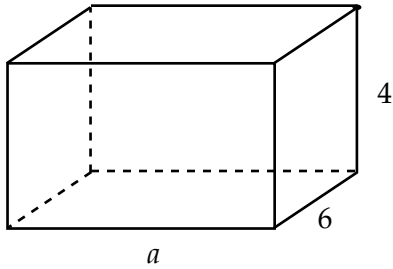


12. Given $\triangle ABC$ and \overline{AB} is parallel to \overline{CD} , if $x = 35$ and $y = 125$, what is the value of z ?



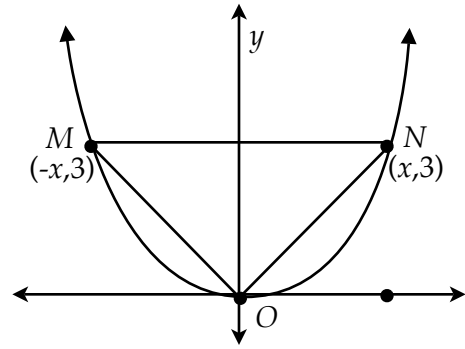
13. Given the following circles, both with center at point O , what is the probability of randomly selecting a point in the shaded area?

14. If $a + b = c + d$, and $a + c = 23$ and $b + d = 27$, what is the value of $c + d$?



15. The above figure is a rectangular solid of dimensions $a \times 6 \times 4$. If the surface area of the figure is 208, what is the value of a ?

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16. If $\frac{12}{x^2} + \frac{4}{x} = 1$, what is the value of $2x^2$?



Note: figure not drawn to scale

17. In the figure above, the area of $\triangle MNO$ is 18. If point M and N lie on the graph of $y = ax^2$, what is the value of a ?

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18. Function f is defined as $f(x) = 3x^2 - 6x + 30$. If $3f(a) = 81$, what is the value of a ?

