2 Module 1 2

Math

35 MINUTES, 22 QUESTIONS

DIRECTIONS

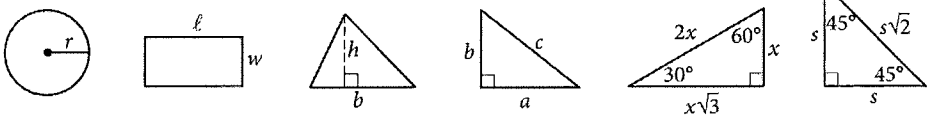
The questions in this section address a number of important math skills.
Use of a calculator is permitted for all questions.

NOTES

Unless otherwise indicated:

- All variables and expressions represent real numbers.
- Figures provided are drawn to scale.
- All figures lie in a plane.
- The domain of a given function f is the set of all real numbers x for which $f(x)$ is a real number.

REFERENCE



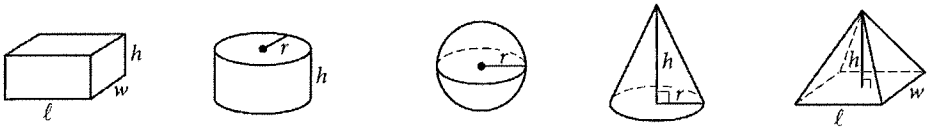
$A = \pi r^2$
$C = 2\pi r$

$A = \ell w$

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

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

Special Right Triangles



$V = \ell wh$

$V = \pi r^2 h$

$V = \frac{4}{3}\pi r^3$

$V = \frac{1}{3}\pi r^2 h$

$V = \frac{1}{3}\ell wh$

The number of degrees of arc in a circle is 360.
The number of radians of arc in a circle is 2π.
The sum of the measures in degrees of the angles of a triangle is 180.

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For multiple-choice questions, solve each problem, choose the correct answer from the choices provided, and then circle your answer in this book. Circle only one answer for each question. If you change your mind, completely erase the circle. You will not get credit for questions with more than one answer circled, or for questions with no answers circled.

For student-produced response questions, solve each problem and write your answer next to or under the question in the test book as described below.

- Once you've written your answer, circle it clearly. You will not receive credit for anything written outside the circle, or for any questions with more than one circled answer.
- If you find more than one correct answer, write and circle only one answer.
- Your answer can be up to 5 characters for a positive answer and up to 6 characters (including the negative sign) for a negative answer, but no more.
- If your answer is a fraction that is too long (over 5 characters for positive, 6 characters for negative), write the decimal equivalent.
- If your answer is a decimal that is too long (over 5 characters for positive, 6 characters for negative), truncate it or round at the fourth digit.
- If your answer is a mixed number (such as $3\frac{1}{2}$), write it as an improper fraction (7/2) or its decimal equivalent (3.5).
- Don't include symbols such as a percent sign, comma, or dollar sign in your circled answer.

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1

If $4m + 3 = 3(m - 2)$, what is the value of $2m^2$?

A) -9

B) 81

C) 162

D) 63

2

The distance from k to 2 is greater than the distance from k to 4. Which of the following equivalents must be true?

A) $k - 4 > 2$

B) $2 < k < 4$

C) $k > 3$

D) $k > 2$

3

If $y = \sqrt{x}(\sqrt{x} - \sqrt{x + 9})$, what is the value of y when $x = 3$?

A) 3

B) -3

C) 12

D) $3(1 - \sqrt{2})$

4

A bike factory that operates 24 hours a day and 7 days a week produces one bike every 25 minutes. How many bikes, y, will the factory produce in x days?

A) $y = \frac{24 \times 60}{25}x$

B) $y = \frac{24 \times 7 \times 60}{25}x$

C) $y = \frac{24 \times 7}{25}x$

D) $y = \frac{24}{25}x$

5

Let function f be defined by $f(x) = x^2 + 6$ and $g(x) = x^2 - 13$. What is the value of $f(g(4))$?

A) 3

B) 15

C) 32

D) 10

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6

x	$f(x)$
1	-4
2	1
3	6

The table above shows some values of x and their corresponding values of $f(x)$ of in the x y-plane. Which of the following functions defines f?

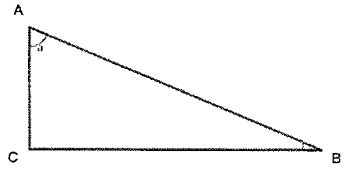
A) $f(x) = -5x - 1$

B) $f(x) = 5x + 9$

C) $f(x) = 5x - 9$

D) $f(x) = -5x + 9$

7



The triangle above is a right triangle. If $\sin(a) = \frac{12}{13}$, what is the value of $\cos(a)$?

8

$$x^2 - 6x + 6 = 0$$

The equation above has two solutions x_1 and x_2. What is the value of x_1+x_2?

9

Which of the following is an equation of a circle in the x y -plane with center $(-5, -8)$, and a diameter of 12?

A) $(x - 5)^2 + (x - 8)^2 = 36$

B) $(x + 5)^2 + (x + 8)^2 = 36$

C) $(x + 5)^2 + (x + 8)^2 = 144$

D) $(x - 5)^2 + (x - 8)^2 = 144$

10

Joy invested $1000 in a savings account that pays an annual interest rate of 5%. The savings account is set to compound annually. How much is in Joy's account after 2 years? (round to the nearest dollar)

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11

Peter walks briskly for x hours and burns 400 calories per hour. Peter runs y hours and burns 800 calories per hour. If Peter plans to burn 2000 calories by walking and running on Sunday, which of the following equations represent this situation?

A) $400y + 800x = 2000$

B) $400x - 800y = 2000$

C) $400x + 800y = 2000$

D) $400y - 800x = 2000$

12

The data set, 1, 4, 7, x, 12, 14,16 has a median of 8.5. What is the value of x?

13

$$8x + 2y = 46$$
$$7x + 3y = 44$$

If the solution to the given system of equations is (x, y), what is the value of x?

A) 3

B) 5

C) 2

D) 8

14

$$6x^2 - 11x - 10 = 0$$

What is the value of the negative solution of the quadratic equation above?

15

If the function is defined by $f(x) = -x^3 - 3x^2 + 12$, what is the value of $f(-3)$?

A) -42

B) 12

C) 66

D) -6

16

A group of student volunteers in the local community delivered foods donated by grocery stores to shelters. They delivered 10 bottles of milk and 20 cartons of eggs to shelter A for a total value of $250, while they delivered 15 bottles of milk and 30 cartons of eggs to shelter B for a total value of $375. Which of the following system of equations can determine the price of each bottle of milk, x, and each carton of eggs, y?

A) $10x + 20y = 375$
$15x + 30y = 250$

B) $10y + 20x = 250$
$15x + 30y = 375$

C) $10x + 20y = 250$
$30x + 15y = 375$

D) $10x + 20y = 250$
$15x + 30y = 375$

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17

The Union Square in San Francisco has an area of 10,522 square meters. What is the area of Union Square in square yards? (1 meter = 1.09 yards)

A) 9,653.21

B) 8,790.31

C) 12,501.19

D) 11,468.98

18

According to the United Nations statistics, 10% of the world's population lived in extreme poverty in 2015. The total world population was 7.34 billion in 2015. How many people lived in extreme poverty, in millions?

A) 7.34

B) 73.4

C) 734

D) 7340

19

Which expression is equivalent to $a\,x^6y^4 + b\,x^2y^4$, where a and b are constant?

A) $a\,x^8 + b\,x^8$

B) $a\,b\,x^2y^8$

C) $x^2y^4(a\,x^3 + b)$

D) $x^2y^4(a\,x^4 + b)$

20

What is the area, in square centimeters, of an isosceles right triangle with one leg of 8 centimeters?

A) 16

B) 32

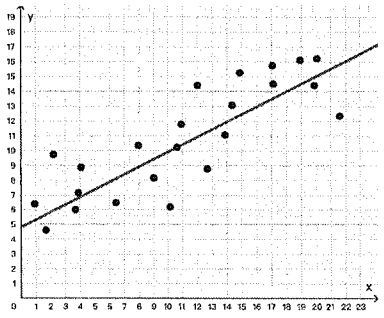
C) 8

D) 64

21

The function f is defined by $f(x) = x^2 - bx - c$, where b and c are constants, if the graph of $y = f(x)$ intersects the x-axis at point $m(-1, 0)$ and point n. The distance from m to n is 6 units, What is the value of $b + c$?

22



The scatterplot above shows the relationship between two variables, x and y. A line of best fit is also shown. Which of the equations best represents the line of best fit shown?

A) $y = -4.8 + 5x$

B) $y = 4.8 - 5x$

C) $y = 4.8 + 0.51x$

D) $y = -4.8 + 0.51x$

No Test Material On This Page