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.

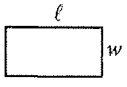
NOTES

Unless otherwise indicated:

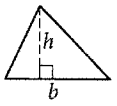
- All variables and expressions represent real numbers.
- Figures provided are drawn to scale.
- All figures lie in a plane.
- The domain of a given function f is the set of all real numbers x for which $f(x)$ is a real number.

REFERENCE

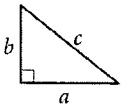
$A = \pi r^2$
$C = 2\pi r$



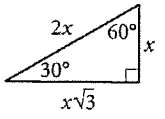
$A = \ell w$

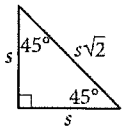


$A = \frac{1}{2}bh$

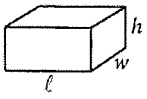


$c^2 = a^2 + b^2$

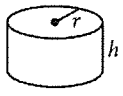




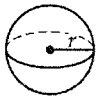
Special Right Triangles



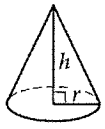
$V = \ell wh$



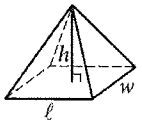
$V = \pi r^2 h$



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



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



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

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.

2 Module 1 2

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.

2 Module 1 2

1

$$3(y - \frac{5}{3}) = 10$$

What value of y is the solution to the given equation?

A) 5

B) 3

C) $\frac{5}{3}$

D) 10

2

$$|x - 5| \leq 7$$

Which of the following inequalities is equivalent to the inequality above?

A) $-7 \leq x \leq 7$

B) $-2 \leq x \leq 12$

C) $x \leq 2$ or $x \geq 12$

D) $x \leq -12$ or $x \geq 2$

3

If $f(x) = -8x + 9$ and $f(k) = -15$, what is the value of k?

4

The length of a swimming pool is 4 times its width. If the width is 25 meters, what is the area of the swimming pool, in square meters?

A) 625

B) 1875

C) 2500

D) 1250

5

Let the function f be defined by $f(x) = (x^6 - 8x^9 + x^2) + (x^2 + 8x^9 - x^6)$. What is the value of $f(8)$?

A) 128

B) 4096

C) 64

D) 256

6

In the x y-plane, line l passes through the point $(5,1)$ and is parallel to the line with the equation $y = -\frac{2}{5}x + \frac{7}{2}$. What is the equation of line l?

A) $y = \frac{2}{5}x + 3$

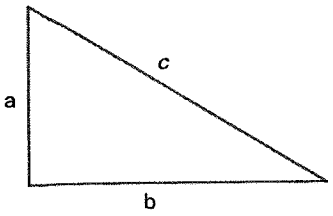
B) $y = -\frac{2}{5}x - 3$

C) $y = -\frac{2}{5}x + 3$

D) $y = \frac{5}{2}x + 3$

2 Module 1 2

7



The length of three sides of the triangle are a, b, and c. Which of the following is/are true?

I. $a + b > c$

II. $|a - c| < b$

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

A) I only

B) II only

C) I and II and III

D) I and III

8

In the x y-plane, what is the y-intercept of the function $y = (x + 3)^2 - 6$?

A) $(-3, -6)$

B) $(0, -6)$

C) (0,3)

D) $(\sqrt{6},0)$

9

In the x y-plane, a circle has center (0,8) and radius 9. Point $(0,k)$ is on the circle and k is a positive constant. What is the value of k?

A) 17

B) -1

C) 9

D) 1

10

$$y = 80(1 + 12\%)^t$$

The Royal Yacht Club was established in 1985 with 80 members. The equation above models the number of the members y, where t is the number of years since 1985. Which of the following equations models the number of members in the yacht club m months since 1985?

A) $y = 80(1 + 12\%)^{\frac{m}{6}}$

B) $y = 80(1 + 12\%)^{12m}$

C) $y = 80(1 + 12\%)^{\frac{m}{12}}$

D) $y = 80(1 + 12\%)^{\frac{m}{4}}$

11

Jay exercises by briskly walking everyday at a constant speed of 5 mph. If Jay walks 3 hours per day, how many miles has Jay walked in the past 20 days?

A) 100

B) 15

C) 300

D) 60

12

23, 25, 32, 27, 40, 37, 35

What is the median of the given data set?

A) 27

B) 32

C) 29.5

D) 33.5

2 Module 1 2

13

A group of 90 people go hiking. A sample of people among the group was selected at random and asked whether they prefer hike a 5 km trail or a 10 km trail. The results show that 70% of the sample respond that they prefer the 10 km trail. Based on the survey, how many people in the group would prefer the 5 km trail?

A) 63

B) 90

C) 27

D) 20

14

$$y - 6 = 5$$
$$(y - 6)^2 = x + 3$$

Which of the following coordinates, (x, y), is a solution to the given system of equations?

A) (22,11)

B) (25,11)

C) (19,11)

D) (11,11)

15

The function is defined by $f(x) = x^3 + x^2 + 3$. What is the value of $f(-2)$?

A) -1

B) 7

C) 15

D) -9

16

76 students went on a field trip together in 5 school buses. Some of the buses can hold 12 students each, while the rest of the buses can hold 20 students each. How many of the buses can hold 20 students? (assuming each bus reached its maximum capacity)

17

A donut machine makes donuts at a rate of 5760 donuts in 8 hours. At this rate, how many donuts does this machine produce per minute?

18

Joanna buys 80 holiday cards. If she gives 55% of the cards to her friends, how many cards does she have left?

A) 44

B) 28

C) 36

D) 30

19

Which expression is equivalent to $8x^3 + 6x^2$?

A) $2x^3(4 + 6x)$

B) $2x^2(4x + 3)$

C) $4x^2(2x + 3)$

D) $2x^2(4 + 3x)$

20

A rectangle has an area of 48 centimeters and length of 6 centimeters. What is the perimeter of this rectangle, in centimeters?

21

Which expression is equivalent to $\frac{5}{2}x^2 - (\frac{3}{2}x^2 - \frac{1}{6}x^2)$?

A) $\frac{5}{3}x^2$

B) $2x^2$

C) $\frac{2}{3}x^2$

D) $3x^2$

22

A company plans on holding an anniversary party. The total cost, y, for the party can be estimated by the linear equation $y = A + Bx$, where x represents the number of participants and A and B are constants. If there are 50 participants, the total cost is \$1525. If there are 80 participants, the total cost is \$2290. What is the value of A?