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.

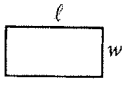
NOTES

Unless otherwise indicated:

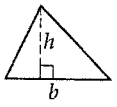
- All variables and expressions represent real numbers.
- Figures provided are drawn to scale.
- All figures lie in a plane.
- The domain of a given function f is the set of all real numbers x for which $f(x)$ is a real number.

REFERENCE

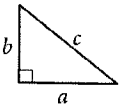
$A = \pi r^2$
$C = 2\pi r$



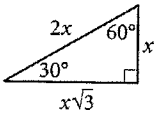
$A = \ell w$

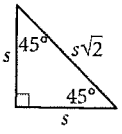


$A = \frac{1}{2}bh$

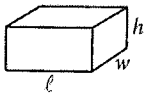


$c^2 = a^2 + b^2$





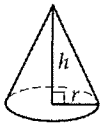
Special Right Triangles



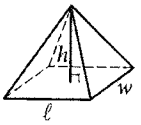
$V = \ell wh$

$V = \pi r^2 h$

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



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



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

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

$$\frac{(8 + 6k - 4k)}{2} = 7$$

What is the solution to the given equation?

A) 1

B) 3

C) 6

D) 10

2

If $-4 \leq 1 - x \leq -2$, what are the possible values of x?

A) $3 \leq x \leq 5$

B) $-5 \leq x \leq -3$

C) $x \leq -5$ or $x \geq -3$

D) $2 \leq x \leq 4$

3

If $f(x) = 6x + 8$, what is the value of $f(0)$?

A) 14

B) 8

C) 2

D) 9

4

The whale population at the beginning of the study was 2100 whales. The number of whales in the population increased at a rate of approximately 35 per year. Which function f gives the number of whales t years after the beginning of the study?

A) $f(t) = 35t + 2100$

B) $f(t) = 35t - 2100$

C) $f(t) = (2100 + 35)t$

D) $f(t) = 2100 - 35t$

5

$$f(x) = ax^3 + x + c$$

The function f is defined above, where a and c are constants. If $f(-1) = 3$ and $f(1) - 7$, what is the value of a?

A) 5

B) 1

C) 4

D) 6

6

The slope of line l is $-\frac{1}{2}$, and line k is perpendicular to line l in the xy-plane. Which of the following functions could define line k?

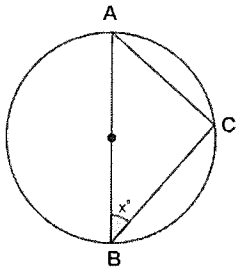
A) $f(x) = 2x + 5$

B) $f(x) = -2x + 3$

C) $f(x) = \frac{1}{2}x + 6$

D) $f(x) = -\frac{1}{2}x + 5$

7



In the circle above, the diameter AB is equal to 10 and the length of AC is equal to 6. What is the area of triangle ABC?

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8

$$f(x) = -3x^2 + 12x + 6$$

For the function above, what is the maximum value?

A) 18

B) 2

C) 15

D) 9

9

Which of the following circles in the xy-plane has a diameter that is not equal to 12?

A) $x^2 + y^2 = 36$

B) $x^2 - 2x + y^2 - 4y = 31$

C) $x^2 - 2x + y^2 - 4y = 36$

D) $x^2 + 4x + y^2 + 6y = 23$

10

Bacteria reproduce by simple asexual binary fission. The initial population of *E.coli* is B and the population doubles every 20 minutes. Which of the following equations represents the total number of *E.coli* bacteria after 3 hours?

A) $y = B(2)^9$

B) $y = B(2)^{180}$

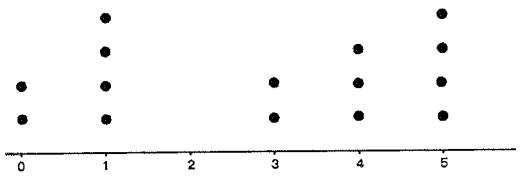
C) $y = B(2)^3$

D) $y = B(2)^{20}$

11

A car traveling at $\frac{1}{2}$ of its usual speed takes an extra 20 minutes to reach its destination. What is the usual time the car takes to cover the same distance at its usual speed?

12



The dot plot represents the distribution of values in a data set. What is the mean value of this data set?

13

A box contains 80 glass beads. 26 beads are blue and 32 beads are red. A bead is picked randomly from the box. What is the probability that the bead is neither blue nor red?

A) $\frac{13}{40}$

B) $\frac{16}{20}$

C) $\frac{11}{40}$

D) $\frac{13}{16}$

14

$$m + 1 = 2m - 616$$

What is the solution to the given equation?

A) 308

B) 206

C) 617

D) 615

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15

The function f is defined by $f(x) = (x^2 - 1)(x + 1)$. What is the value of $f(3)$?

A) 32

B) 40

C) 24

D) 12

16

The average of three numbers is 60. If two of the numbers have a sum of 135, what is the third number?

A) 60

B) 45

C) 75

D) 90

17

A side length of a square is 6 inches. What is the area of the square, in square centimeters? (1 inch = 2.54 centimeters)

A) 36

B) 91.44

C) 232.26

D) 165

18

A student went to a bookstore and paid a total of $150 to purchase books and notebooks. If the student spent 70% of the money on books, how many dollars did he spend on notebooks?

19

Which expression is equivalent to $(6x^3 - 2x^2) - (5x^3 - 2x^2)$?

A) x^3

B) $x^2(x - 4)x$

C) $x^2(11x - 4)$

D) $x^4(x^2 - 1)$

20

Square A has an area of 16 square inches. One side of Square B is 3 times the side of Square A. What is the area of Square B, in square inches?

21

The variable y is the value of x increased by 35% and then decreased by 25%. Which of the following expressions represents the relationship between x and y?

A) $y = x(1 + 35\% - 25\%)$

B) $y = x(1 + 35\%)$

C) $y = x(1 + 35\%)(1 - 25\%)$

D) $y = x \cdot 35\% - x \cdot 25\%$

22

Lucas ran $\frac{4}{5}$ of a kilometer in 6 minutes. How many miles can Lucas run in half an hour? (1 kilometer = 0.62 miles)

A) 4

B) 2.48

C) 15.5

D) 8

No Test Material On This Page