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.

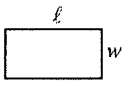
NOTES

Unless otherwise indicated:

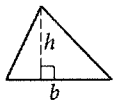
- All variables and expressions represent real numbers.
- Figures provided are drawn to scale.
- All figures lie in a plane.
- The domain of a given function f is the set of all real numbers x for which $f(x)$ is a real number.

REFERENCE

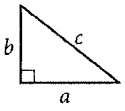
$A = \pi r^2$
$C = 2\pi r$



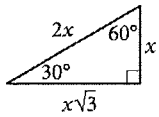
$A = \ell w$

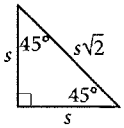


$A = \frac{1}{2}bh$

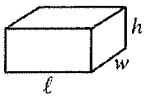


$c^2 = a^2 + b^2$

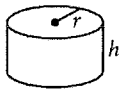




Special Right Triangles

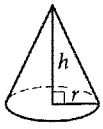


$V = \ell wh$

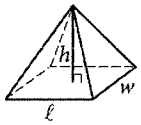


$V = \pi r^2 h$

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



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



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

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.

2 Module 1 2

1

If $3m + 6 = 6m - 16$, what is the value of $3m$?

A) -22

B) 22

C) 10

D) -10

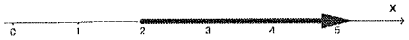
2

Which graph shows the solution to $2x - 1 \geq 3$?

A)

B)

C)



D)

3

If the function f is defined by $f(x) = \sqrt{x} + 6$, what is the value of $f(25)$?

A) 31

B) 11

C) 12

D) 16

4

A car rental company charges a one-time service fee of \$120 and a daily fee of \$55. Kevin spent a total of y dollars to rent a car for D days during his vacation. Which of the following equations represents how much Kevin paid to rent a car?

A) $y = 55 + 120D$

B) $y = (120 + 55)D$

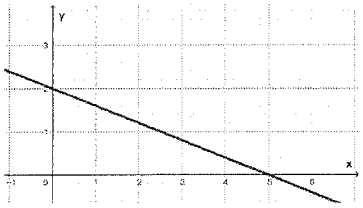
C) $y = (120 - 55)D$

D) $y = 120 + 55D$

5

What is 25% of 400?

6



The graph of the linear function f is shown. Which equation defines $f(x)$?

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

B) $f(x) = -\frac{2}{5}x - 2$

C) $f(x) = \frac{2}{5}x + 2$

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

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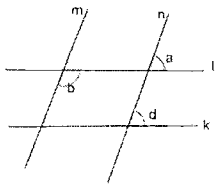
7



In the figure above, lines l and k are parallel, and lines m and n are parallel. If $\angle a = 70°$, what is the value of $\angle b + \angle d$?

A) 90°

B) 108°

C) 144°

D) 180°

8

	With a logo	Without a logo	Total
Yellow t-shirt	5	15	20
Green t-shirt	12	18	30
Total	17	33	50

50 students signed up for the "Children's Run" charity event that raised money for the Children's Hospital. The data regarding t-shirts worn by the 50 students during the event is shown above. If one student is randomly selected from 50 students, what is the probability that this student wore either a yellow t-shirt with a logo or a green t-shirt without a logo?

A) $\frac{23}{50}$

B) $\frac{27}{50}$

C) $\frac{20}{50}$

D) $\frac{30}{50}$

9

$$6x + 3y = 18$$
$$-6x - 2y = 12$$

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

A) 30

B) 6

C) 12

D) 0

10

If $\frac{(2x^2 + 2)^2}{x^2 + 1} = 8$, what is the value of $x^2 + 1$?

11

A school library's book-purchase budget this year is \$1200. The librarian plans to purchase x novels at an average price of \$12 each and y non-fiction books at an average price of \$18 each. Which of the following equations represents this situation?

A) $18x + 12y = 1200$

B) $12x + 18y = 1200$

C) $(x + y) = 1200$

D) $12x - 18y = 1200$

12

If a student walks at an average speed of 0.1 kilometers per minute, what is the student's average speed in miles per hour? (1 kilometer = 0.62 miles)

A) 37.2

B) 6

C) 3.72

D) 3.02

2 Module 1 2

13

Which expression is equivalent to $3a^7b^8 + 9a^2b^3$?

A) $3a^2b^3(a^5b^5 + 2)$

B) $3a^2b^3(a^5b^5 + 3)$

C) $3a^2b^3(3a^5 - 3)$

D) $3a^2b^3(a^5 + 2b)$

14

$$3x^2 + 6x + c = 0$$

In the quadratic equation above, c is a constant. For what value of c does the equation have only one solution?

15

There are 80 students in Grade 9, and 25% are enrolled in the Tennis Club. How many students in Grade 9 are not in the Tennis Club?

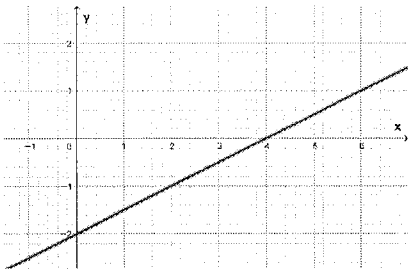
A) 60

B) 20

C) 25

D) 52

16



The graph of $y = f(x + 6)$ is shown above. Which equation defines f?

A) $f(x) = \frac{1}{2}x + 4$

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

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

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

17

The graph of a circle in the xy-plane is defined as $x^2 + 4x + y^2 + 10y = -13$. What is the circle's diameter?

A) 8

B) 26

C) 4

D) 5

18

Anna bikes for 10 minutes at a constant speed of 15 miles per hour from her house to the grocery store. How many minutes would it take her to walk the same distance at a constant speed of 3 miles per hour?

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19

The volume of a cube is 512 cubic inches. What is the area, in square inches, of one face of the cube?

A) 16

B) 32

C) 64

D) 340

20

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

A) -20

B) -4

C) -10

D) -8

21

Data Value	Frequency
3	2
5	8
8	3
16	2
9	7

The frequency table summarizes the 22 data values in the data set. What is the mean data value of the data set?

22

$$y = x^2 + 5x - 5$$
$$y = 2x - 1$$

In the xy-plane, the two lines expressed in the system of equations given intersect at $m(x_0, y_0)$ and $n(x_1, y_1)$. What is the distance between m and n ?

A) 125

B) 10

C) 5

D) $5\sqrt{5}$

No Test Material On This Page