2 Module 2 2

Math

35 MINUTES, 22 QUESTIONS

DIRECTIONS

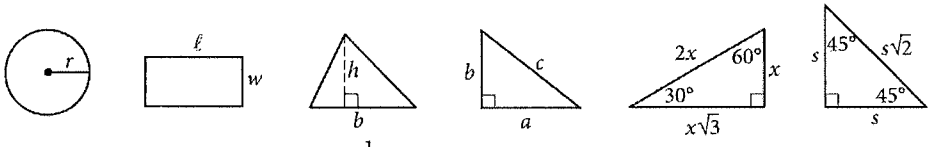
The questions in this section address a number of important math skills.
Use of a calculator is permitted for all questions.

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



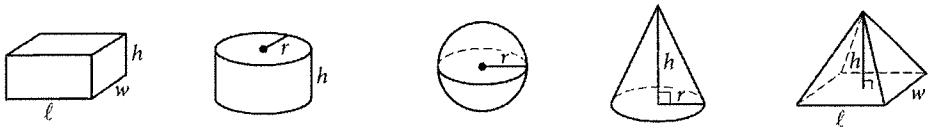
$A = \pi r^2$
$C = 2\pi r$

$A = \ell w$

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

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

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 $6x - 3y = 4$, what is the value of $\frac{3y + 4}{3x}$?

2

$f(x) = x^2 + 8x + 17$, if $y = f(x)$ in the xy-plane, what is the value of $f(x)$?

A) 1

B) 65

C) -31

D) 4

3

$$y - 2x = 2$$
$$2y + 4x = 5$$

Based on the system of equations above, what is the value of $2(y^2 - 4x^2)$?

A) 9

B) 11

C) 5

D) 10

4

In a graph of the x y-plane, line l is perpendicular to line m. Which of the following systems of equations represents the two lines?

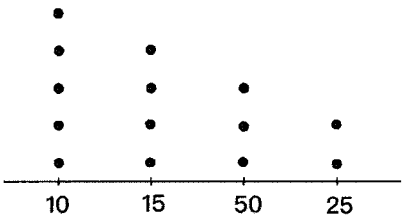
A) $5y - 4x = 20$
$4y + 5x = 15$

B) $4y - 2x = 5$
$4y + 2x = 6$

C) $3y - x = 5$
$2y + x = 3$

D) $y - 3x = 2$
$y + 3x = 3$

5



100 families in a certain area were asked how many children they had, and the results are shown in the dot plot above. What is the median number of children per family for the 100 families?

6

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

In the given equation, c is a constant. If the equation has no real solution, what is the value of c?

A) 4

B) 9

C) 10

D) 8

7

In the right triangle MQP, the angle Q has a measure of 90° and the two legs of the triangle have lengths of 4 and 8, respectively. What is the measure of the largest acute angle?

A) 45°

B) 60°

C) 30°

D) 20°

8

What number is 120% of 80?

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9

$$P(x) = 150(F)^x$$

The function $P(x)$ models the specific population of wildlife t years after the start of the study, where F is a constant. If the population of wildlife decreases by 12% each year, what is the value of F?

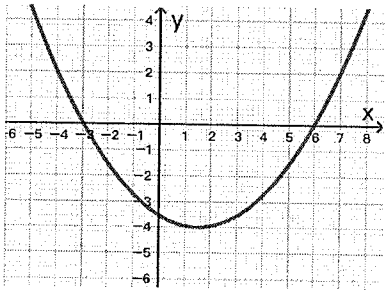
A) 1.12

B) 0.88

C) 0.12

D) 0.10

10



What is the y-intercept of the graph shown?

A) (−3.5,0)

B) (−3,0)

C) (0, − 3.5)

D) (6,0)

11

Alex walked at a constant speed of 8 kilometres per hour for thirty minutes and slowly walked for another thirty minutes at an average rate of 5 miles per hour. What is the total distance Alex traveled, in miles? (1 kilometer = 0.62 miles)

A) 4.98

B) 6.5

C) 8.03

D) 7

12

In the x y-plane, if $y = f(x) = x^2 + 6x - 3$, and $y = g(x) = x^2 - 11x + 14$, $f(x)$ and $g(x)$ intersect at point(m, n), what is the value of n?

13

From Los Angeles to Vancouver, the driving distance is 2055 kilometers, which takes approximately 24.5 hours. The flight distance is 1740 kilometers and the flight time is approximately 3 hours. Approximately how many times the average driving speed is the average flying speed? (To the nearest whole number)

A) 8

B) 7

C) 10

D) 15

14

$$f(x) = a x^2 - 16x + 24$$

The given equation $y = f(x)$ intersect x-axis at (2, 0) and $(m, 0)$ in the x y-plane, where a and m are constants. What is the value of m?

15

$$x - 6 = -10$$
$$y = x^2 - 3x - 9$$

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

A) (−4, − 5)

B) (−4,19)

C) (4,5)

D) (4,19)

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16

An isosceles triangle has a height of 4 inches and a base of 6 inches. What is the perimeter of this triangle, in inches?

A) 12

B) 16

C) 13

D) 32

17

Mike and Alex typed at constant speeds and together they typed a total of 1440 words in 4 minutes. If Mike typed 14 less words per minute than Alex, how many words did Mike type per minute?

18

Which expression is equivalent to $(5x^3 + 9) - (5x^3 + x^2)$?

A) $10x^3 - x^2 + 9$

B) $(3 + x)(3 - x)$

C) $10x^3 + x^2 + 9$

D) $x^2 - 9$

19

Which expression is equivalent to $\sqrt[3]{p^2} \cdot \sqrt[15]{p^5}$, where $p > 0$?

A) $\sqrt[18]{p^7}$

B) $\sqrt[12]{p^3}$

C) $\sqrt[45]{p}$

D) p

20

Line l is tangent to the circle $x^2 + y^2 = 2$ at the point $(1, -1)$. Which of the following equations represents the line l?

A) $x - y = 4$

B) $x - y = 2$

C) $x + y = 2$

D) $x + y = 4$

21

	English Test			French Test		
Marks	A	B	C	A	B	C
Number of Students	18	15	5	15	17	6

Grade 11 has 38 students. The table above shows the results of the recent English and French tests. If one of the students is chosen at random, what is the probability that the person received a B on the French test?

A) $\frac{17}{38}$

B) $\frac{17}{76}$

C) $\frac{17}{32}$

D) $\frac{32}{38}$

22

Victor reads books at an average rate of 3 days per book. Which function, y, models the number of days it will take Victor to read x books at this rate?

A) $y = 3x$

B) $y = \frac{1}{3}x$

C) $y = x - \frac{1}{3}$

D) $y = x + \frac{1}{3}$