2 Module 1 2

Math

35 MINUTES, 22 QUESTIONS

DIRECTIONS

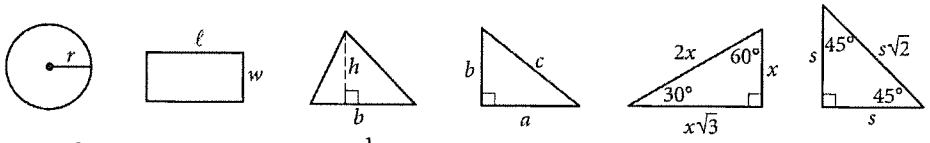
The questions in this section address a number of important math skills.
Use of a calculator is permitted for all questions.

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



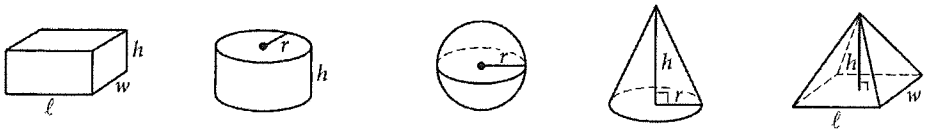
$A = \pi r^2$
$C = 2\pi r$

$A = \ell w$

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

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

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 $\frac{5}{3}y + 2 = 7$, what is the value of y?

A) 5

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

C) $\frac{19}{5}$

D) 3

2

A school plans to spend a total of \$800 to buy some pens and notebooks. If each pen costs \$2 and each notebook costs \$5, which inequality represents the possible number of pens, p, and notebooks, n, the school can buy?

A) $2p + 5n < 800$

B) $\frac{1}{2}p + \frac{1}{5}n \leq 800$

C) $2p + 5n \leq 800$

D) $\frac{p}{2} + \frac{n}{5} < 800$

3

If $f(x) = 5x^2 + 3$ and $f(k) = 48$, what is the value of k^2?

A) 3

B) -3

C) 9

D) 5

4

An ice cream vendor sells ice cream at a night market on Sunday night. Each ice cream costs him \$4, so he charges \$8 for each ice cream at the night market. He also has to pay \$20 per hour to rent a booth. If the vendor sells c ice creams and rents the booth for h hours, which of the following is equivalent to the vendor's profit, p, in dollars?

A) $p = 8c - 20h - 4$

B) $p = 4c - 20h$

C) $p = 4h - 8c$

D) $p = 12c - 20h$

5

If $f(x) = x - \sqrt{3x - 1}$, at which of the following values is $f(x)$ undefined?

A) $x \leq \frac{1}{3}$

B) $x < \frac{1}{3}$

C) $x = 1$

D) none

6

In the xy-plane, a circle has center $(0,m)$ and radius 5. The point (4,3) is on the circle. If m is a constant and $m \neq 0$, what is a possible value of m?

A) 6

B) 3

C) -6

D) 0

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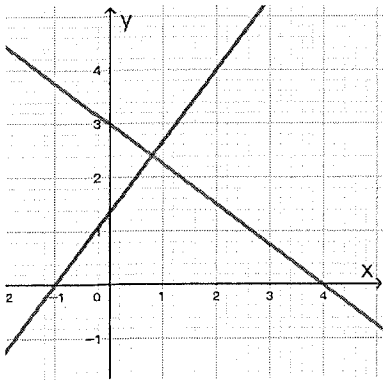
7



The graph shown above represents which of the following systems of equations?

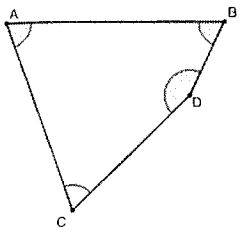
A) $4y - 3x = 12$
$3y + 4x = 4$

B) $4y - 3x = 12$
$3y - 4x = 4$

C) $4y + 3x = 12$
$4y - 3x = 4$

D) $4y + 3x = 12$
$3y - 4x = 4$

8

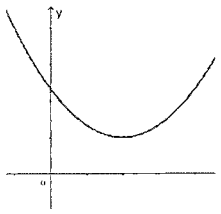


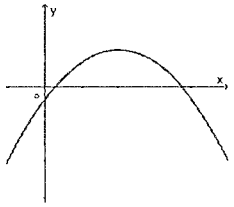
The quadrilateral $ABCD$ is shown, where $\angle A = 70°$, $\angle B = 65°$, and $LC = 63°$. How many degrees is the angle D?

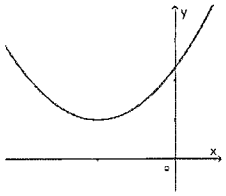
9

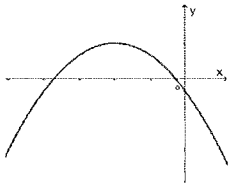
$$f(x) = a(x - m)^2 + n$$

In the function f above, a, m, and n are constants and are greater than zero. Which of the following graphs represents the function f?

A)


C)


B)


D)


10

For a bank savings account, the annual interest rate was 2.5% in 2021 and the annual interest rate was 3.5% in 2022. If Jack deposited $1,000 into his savings account on January 1, 2021, how many dollars would Jack withdraw on December 31, 2022? (Round to the nearest dollar)

A) 1035

B) 1061

C) 1071

D) 1051

11

A cyclist rides from his house to a park in 5 hours at a constant speed of 12 mph while he rides back home at a constant speed of 15 mph. How many hours did he take to return to his house?

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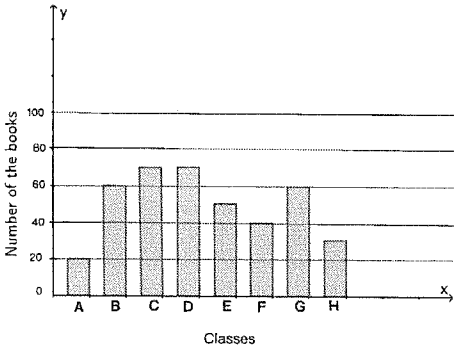
12



The histogram above shows the number of books read by each class during a school reading event. If the students in the 8 classes read a total of 420 books, how many books did the students in class E read?

13

	Vegetarian	Non-vegetarian	Total
Female	160	200	360
Male	50	200	260
Total	210	400	610

A researcher conducted a survey to determine the number of vegetarians in a small community. The results are shown above. If a female is selected at random, what is the probability that the female is vegetarian?

A) $\frac{16}{61}$

B) $\frac{4}{9}$

C) $\frac{36}{61}$

D) $\frac{5}{9}$

14

$$6x + 8 = 20$$

Which equation has the same solutions as the given equation above?

A) $6x = 28$

B) $2x + 4 = 10$

C) $5x + 8 = 18$

D) $3x + 4 = 20$

15

The function is defined by $f(x) = x^3 + 3x^2 - 6$. What is the value of $f(-2)$?

A) -2

B) -10

C) 14

D) -26

16

A person spent a total of \$25,500 to buy two stocks, A and B, and sold both when the values of stock A rose by 15% and the values of stock B fell by 10%, making a total profit of \$1,650. What was the value of stock A when the person first purchased it?

17

The price of potatoes is \$2.25 per pound. How many kilograms of potatoes would cost 20 dollars? (1 pound = 0.45 kilograms)

A) 45

B) 8

C) 4

D) 49.38

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18

If 20% of the total books Lucas plans to read this year is 60, how many books does Lucas plan to read ?

A) 24

B) 300

C) 48

D) 150

19

Which expression is equivalent to :

$$(x^5 \cdot y^{-3} \cdot z^2)(x^{-4} \cdot y^2 \cdot z^{-1})?$$

A) $x \cdot y^{-1} \cdot z$

B) $x \cdot y^{-6} \cdot z$

C) $x^{-9} \cdot y^{-5} \cdot z^{-3}$

D) $x \cdot y \cdot z$

20

Circle x has an area of 4π and the perimeter of circle y is 4 times the perimeter of circle x. How many times the radius of circle x is the radius of circle y?

A) 4

B) 2

C) 3

D) 5

21

A company's number of employees increased from 900 at the beginning of the year to 1008 at the end of the year. What is the percent increase in the company's number of employees?

A) 12%

B) 10.7%

C) 11%

D) 13%

22

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

The function f is given. Which table of values represents $y = f(x) + 3$?

A)

x	y
-1	7
-2	6
1	4

B)

x	y
-1	7
-2	6
1	5

C)

x	y
-1	7
-2	6
1	3

D)

x	y
-1	7
-2	6
1	2

No Test Material On This Page