SAT Prep—Math
Extra Practice: Harder

DIRECTIONS

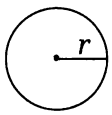
The questions in this section address a number of important math skills.
Use of a calculator is permitted for all questions.

NOTES

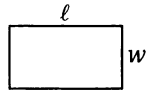
Unless otherwise indicated:

- 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.

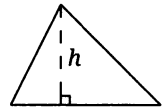
REFERENCE



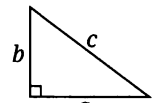
$A = \pi r^2$
$C = 2\pi r$



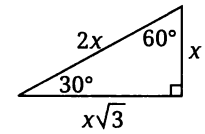
$A = \ell w$

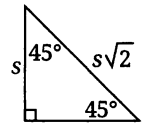


$A = \frac{1}{2}bh$

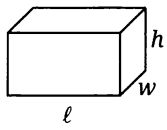


$c^2 = a^2 + b^2$

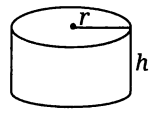




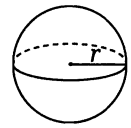
Special Right Triangles



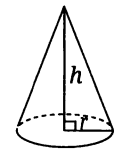
$V = \ell wh$



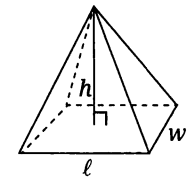
$V = \pi r^2 h$



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



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



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

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.

CONTINUE

For multiple-choice questions, solve each problem, choose the correct answer from the choices provided, and then fill in the circle with the answer letter. Enter only one answer for each question. You will not get credit for questions with more than one answer entered, or for questions with no answers entered.

For student-produced response questions, solve each problem and write your answer in the test book as described below.

- Enter your answer into the box provided.
- If you find **more than one correct answer**, enter 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.
- 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 enter **symbols** such as a percent sign, comma, or dollar sign in your answer.

CONTINUE

1 Mark for Review

A randomly selected sample from the 250 apple trees in an orchard is analyzed to determine whether the trees' apples are ripe. Among the trees in the sample, 64% have ripe apples. Which of the following is the best estimate of the total number of apple trees with ripe apples in the orchard based on this analysis?

(A) 64

(B) 90

(C) 160

(D) 250

2 Mark for Review

A carpenter works for a total of 35 hours each week making chairs and tables one at a time. The carpenter spends 3 hours making each chair and 7 hours making each table. Which of the following equations could represent the relationship between the number of chairs, c, and tables, t, the carpenter makes in a week?

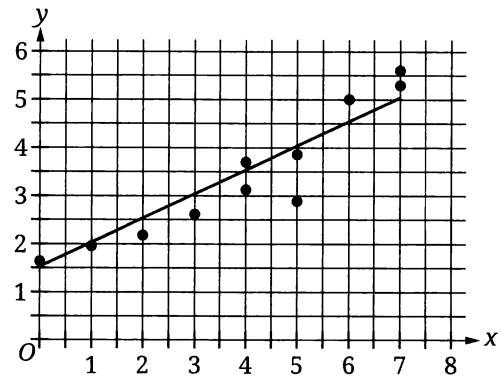
(A) $3c + 7t = 35$

(B) $7c + 3t = 35$

(C) $(c + t)(3 + 7) = 35$

(D) $(3 + c)(7 + t) = 35$

3 Mark for Review



Which of the following linear equations most nearly represents the line of best fit as shown in the scatterplot?

(A) $y = -0.5x - 1.5$

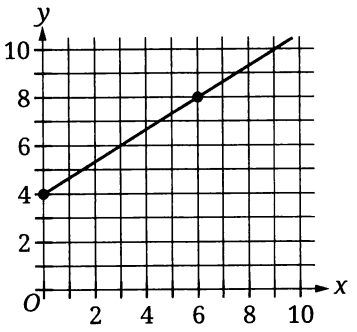
(B) $y = -0.5x + 1.5$

(C) $y = 0.5x - 1.5$

(D) $y = 0.5x + 1.5$

CONTINUE

4 Mark for Review



A line graphed in the xy-plane is shown. The point $(5, a)$ is on the line. What is the value of a?

(A) $\frac{3}{2}$

(B) $\frac{19}{3}$

(C) $\frac{43}{6}$

(D) $\frac{22}{3}$

5 Mark for Review

x	$h(x)$
0	19
1	27
2	37

For the quadratic function h, the table shows three values of x and their corresponding values of $h(x)$. Which of the following equations defines h?

(A) $h(x) = x^2 + 7x + 19$

(B) $h(x) = 2x^2 + 6x + 19$

(C) $h(x) = 3x^2 + 5x + 19$

(D) $h(x) = 6x^2 + 2x + 19$

6 Mark for Review

$$g(x) = \frac{3}{4}x + 6$$

The function g is defined by the given equation. If m is a constant and $g(m) = 12$, what is the value of m?

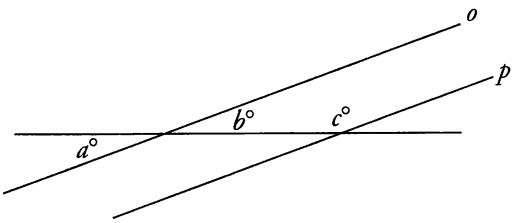
(A) 8

(B) 9

(C) 12

(D) 15

7 Mark for Review



Note: Figure not drawn to scale.

The figure shows parallel lines o and p. What is the value of c if $a = 3x + 10$ and $b = 9x - 8$?

(A) 3

(B) 19

(C) 38

(D) 161

CONTINUE

8 Mark for Review

Line m is parallel to line l in the xy-plane, and line l is defined by $21y + \frac{7}{2} = -3x$. What is the slope of line m?

(A) -7

(B) $-\frac{1}{7}$

(C) $\frac{1}{7}$

(D) 7

9 Mark for Review

A solid brick in the shape of a rectangular prism has a length of 24 centimeters (cm), a width of 11.2 cm, and a height of 7 cm. The mass of the brick is 3,100 grams. To the nearest tenth, what is the density of the brick in grams per cubic centimeter?

(A) 0.3

(B) 0.6

(C) 1.6

(D) 3.9

10 Mark for Review

The function $R(v) = 120(0.98)^{\frac{1}{2}v}$ models the value, in thousands of dollars, of a house on a street with v vacant lots on it. What is the value of r if the value of the house is predicted to decrease by $r\%$ for every 2 vacant lots?

(A) 0.5

(B) 0.98

(C) 1

(D) 2

11 Mark for Review

The equation $\frac{81}{23}x - \frac{27}{7} = 3(ax + b)$ has infinitely many solutions. If a and b are constants, what is the value of b?

12 Mark for Review

The seniors of school A are planning to invite the seniors from school B and school C to an event, and they need to estimate the numbers of seniors. There are 168 seniors at school A, which is 40% fewer than at school B. If school B has 160% of the number of seniors that school C has, how many seniors are at school C?

CONTINUE

13 Mark for Review

The equation $-x^2 + 10x = k$, where k is a constant, has exactly two real solutions. If $s < k$, what is the greatest possible integer value of s?

Ⓐ 4

Ⓑ 10

Ⓒ 24

Ⓓ 25

14 Mark for Review

In trivia competitions, the 4 players on team X score a mean of 815 points each. The 6 players on team Y score a mean of 740 points each. If the two teams combine to form team Z, what will be the mean number of points likely to be scored by each player on Team Z?

15 Mark for Review

$$9x^2 - bx - 28 = (fx - g)(x + h)$$

In the given equation, f, g, and h are all integer constants, and b is a constant. Which of the following must be an integer?

Ⓐ $\frac{28}{f}$

Ⓑ $\frac{28}{g}$

Ⓒ $\frac{b}{f}$

Ⓓ $\frac{b}{g}$

16 Mark for Review

$$y = 3$$
$$y = -2x^2 + 4x + k$$

In the given system of equations, k is a constant. What is the value of k if the system of equations has exactly one real solution?

17 Mark for Review

$$ay = -\frac{6}{5}x + 2$$
$$x + 5 = 4x + y$$

The given system of equations has infinitely many solutions. What is the value of the constant a?

Ⓐ $-\frac{6}{5}$

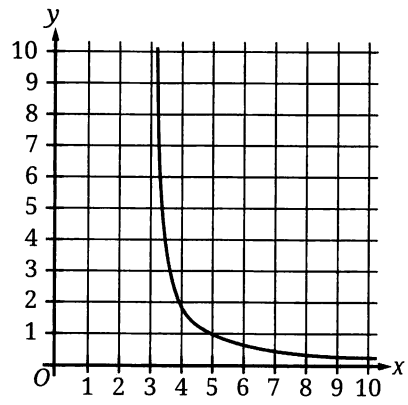
Ⓑ $-\frac{2}{5}$

Ⓒ $\frac{2}{5}$

Ⓓ $\frac{6}{5}$

CONTINUE

18 Mark for Review



A partial graph of the rational function g is shown.

The equation of $y = g(x)$ can be written in the form $g(x) = \frac{a}{x+b}$, where a and b are constants. If $h(x) = g(x - 3)$, which equation could define function h?

(A) $h(x) = \frac{2(x-3)}{(x-3)}$

(B) $h(x) = \frac{2}{x-6}$

(C) $h(x) = \frac{2}{(x-3)}$

(D) $h(x) = \frac{2}{x}$

19 Mark for Review

21, 24, 25, 19, 24, 18, 23

The given list shows 7 of the 8 positive integers greater than 10 that make up a data set. The mean of these integers is 22, and the mean of the full data set is an integer less than 22. What is the value of the smallest integer in the full data set?

(A) 6

(B) 14

(C) 19

(D) 21

CONTINUE

20 Mark for Review

$$x^2 + y^2 - 2x - 4y - 11 = 0$$

The equation of a circle is shown. What is the circle's radius when it is graphed in the xy-plane?

21 Mark for Review

The equation $4 = x(ax + 12)$, in which a is an integer constant, has at least one real solution. What is the least possible value of a?

22 Mark for Review

Two identical right cylinders each have a height of 120 inches (in) and a surface area of A in^2. If the cylinders are combined along the circular bases, the resulting cylinder has a surface area of $\frac{41}{21}A$ in^2. What is the radius, in inches, of each cylinder?

(A) 2

(B) 3

(C) 6

(D) 36

CONTINUE