SAT Prep Test 2—Math
Module 2—Harder

Turn to Section 2 of your answer sheet (p. 664) to answer the questions in this section.

DIRECTIONS

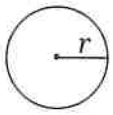
The questions in this section address a number of important math skills.
Use of a calculator is permitted for all questions.

NOTES

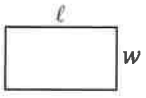
Unless otherwise indicated:

- 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.

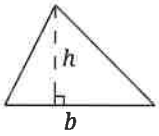
REFERENCE



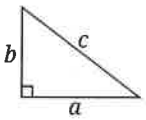
$A = \pi r^2$
$C = 2\pi r$



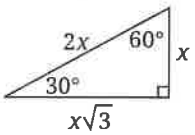
$A = \ell w$

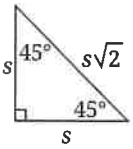


$A = \frac{1}{2}bh$

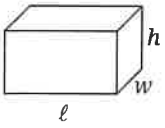


$c^2 = a^2 + b^2$

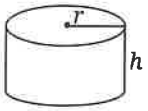




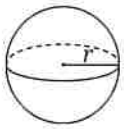
Special Right Triangles



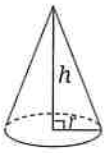
$V = \ell wh$



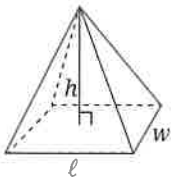
$V = \pi r^2 h$



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



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



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

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 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 enter **symbols** such as a percent sign, comma, or dollar sign in your circled answer.

CONTINUE

1 Mark for Review

Which of the following is equivalent to $3a^3 - 5a^3 + 6a$?

(A) $-2a^3 + 6a$

(B) $3a^3 + a$

(C) $4a$

(D) $-15a^9 + 6a$

2 Mark for Review

In a shipment of 45,000,000 shirts, 4,950,000 are white. What percentage of the shirts are white shirts?

(A) 11%

(B) 22%

(C) 78%

(D) 89%

3 Mark for Review

If $3(x - 8) - 16 = 8(x + 10) + x$, what is the value of $6x$?

4 Mark for Review

$$8(a - 3) - 17 = 9(a - 3)$$

In the given equation, what is the value of $a - 3$?

(A) −20

(B) −17

(C) −14

(D) 3

5 Mark for Review

A school classroom with a total of 4,200 floor tiles is divided into a 30 square-foot lab area and an 80 square-foot seating area. The number of tiles on the entire classroom floor can be represented by the equation $30a + 80b = 4{,}200$. In this context, which of the following does b represent?

(A) The average number of tiles per square foot in the lab area

(B) The total number of tiles in the lab area

(C) The average number of tiles per square foot in the seating area

(D) The total number of tiles in the seating area

CONTINUE

6 Mark for Review

A triangle has a base that is 65% of its height. If the base were decreased by 13 inches, how would the height need to change to keep the same proportions?

(A) It must increase by 13 inches.

(B) It must increase by 20 inches.

(C) It must decrease by 13 inches.

(D) It must decrease by 20 inches.

7 Mark for Review

If $\frac{a}{3} = 10 - 7b$ and $a \neq 0$, which of the following correctly expresses b in terms of a?

(A) $b = \frac{a-21}{30}$

(B) $b = \frac{30-a}{21}$

(C) $b = 10 + \frac{a}{3}$

(D) $b = 10 + \frac{3}{a}$

8 Mark for Review

For all positive values of y, the expression $\frac{3}{y+c}$ is equivalent to $\frac{15}{5y+30}$. What is the value of constant c?

(A) 3

(B) 6

(C) 8

(D) 150

9 Mark for Review

In the xy-plane, the equation $(x-7)^2 + (y+7)^2 = 64$ defines circle O, and the equation $(x-7)^2 + (y+7)^2 = c$ defines circle P. If the two circles have the same center, and the radius of circle P is three less than the radius of circle O, what is the value of constant c?

CONTINUE

10 Mark for Review

A school has received a donation of $20,000 for the purchase of new laptops. If each laptop costs $149, no tax is charged, and the laptop manufacturer offers a 7.5% discount on orders of at least 100 laptops, what is the maximum number of laptops the school can purchase with the donation?

(A) 124

(B) 134

(C) 145

(D) 146

11 Mark for Review

$$3x^2 - y - 26 = 0$$
$$y = -3x + 10$$

The point (a, b) is an intersection of the system of equations above when graphed in the xy-plane. What is a possible value of a?

(A) -4

(B) 6

(C) 20

(D) 26

12 Mark for Review

How many values for y satisfy the equation $-6(4y + 2) = 3(4 - 8y)$?

(A) Zero

(B) Exactly one

(C) Exactly two

(D) Infinitely many

13 Mark for Review

A parabola represents the graph of the function f in the xy-plane, where $y = f(x)$. If the vertex of the parabola is $(5, -4)$ and one of the x-intercepts is $(-1.5, 0)$, what is the other x-intercept?

(A) $(-6.5, 0)$

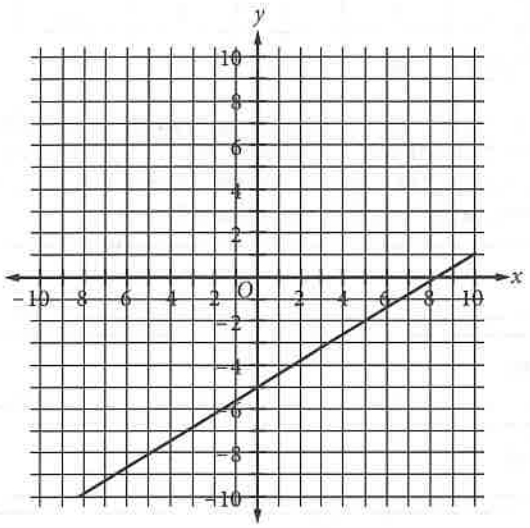
(B) $(1.5, 0)$

(C) $(3.5, 0)$

(D) $(11.5, 0)$

CONTINUE

14 Mark for Review



Which equation defines function g, if the graph of $y = g(x) - 10$ is shown above?

(A) $y = \frac{3}{5}x - 15$

(B) $y = \frac{3}{5}x - 5$

(C) $y = \frac{3}{5}x + 5$

(D) $y = \frac{3}{5}x + 10$

15 Mark for Review

If c is a constant in the equation $10x^2 + c = -5x$, and the equation has no real solutions, what is the value of c?

(A) -20

(B) -5

(C) 0

(D) 1

16 Mark for Review

$$3x - 4y = 17$$

In the xy-plane, the graph of a line with an x-intercept of $(c, 0)$ and a y-intercept of $(0, k)$, where c and k are constants, can be represented by the equation above. What is the value of $\frac{c}{k}$?

(A) $-\frac{4}{3}$

(B) $-\frac{3}{4}$

(C) $\frac{3}{4}$

(D) $\frac{4}{3}$

CONTINUE

17 Mark for Review

$$-7 + 2f = cg$$
$$21g + 21 = 6f - 15g$$

If c is a constant, and the system of equations shown above has infinitely many solutions, what is the value of c?

18 Mark for Review

Triangle A has angles measuring 30°, 60°, and 90°. What is the perimeter, in centimeters, of this triangle if the smallest side has a length of 15 centimeters?

(A) $15\sqrt{3}$

(B) $15 + 15\sqrt{3}$

(C) $45 + 15\sqrt{3}$

(D) $45\sqrt{3}$

19 Mark for Review

x	2	4	6	8
$g(x)$	46	0	−46	−92

Four values of x and their corresponding values of $g(x)$ are shown in the table above for the linear function g. The equation $g(x) = cx + d$ defines function g, and c and d are constants. What is the value of $c + d$?

(A) −23

(B) 69

(C) 92

(D) 115

20 Mark for Review

114, 109, 106, 111

A data set consists of 5 positive integers greater than 101. What is the value of the smallest integer in the data set if the mean of the entire data set is an integer that is less than the mean of the four integers from the data set shown above?

CONTINUE

21 Mark for Review

A teacher awards points to a class based on completed assignments. He gives 5 points per assignment for the first 50 completed assignments and 3 points for each additional completed assignment beyond 50. When $a \geq 50$, which function g gives the total number of points earned by the class for a completed assignments?

(A) $g(a) = 3a + 5$

(B) $g(a) = 3a + 100$

(C) $g(a) = 3a + 250$

(D) $g(a) = 8a - 150$

22 Mark for Review

In triangles ABC and XYZ, $AB = 22$, $XY = 11$, and angles A and X both measure 77°. Which of the following pieces of information, if any, would be enough to prove that the two triangles are similar to each other?

I. Angle B measures 40°

II. Angle Y measures 50°

III. Angle Z measures 63°

(A) No additional information is necessary.

(B) Angle measures alone do not provide enough information.

(C) I and II together provide enough information.

(D) I and III together provide enough information.

STOP

If you finish before time is called, you may check your work on this module only.
Do not turn to any other module in the test.