WEEK2.2

SAT Prep Test 2—Math
Module 1

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

DIRECTIONS

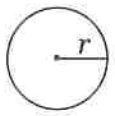
The questions in this section address a number of important math skills.
Use of a calculator is permitted for all questions.

NOTES

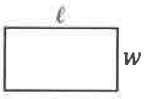
Unless otherwise indicated:

- 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.

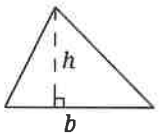
REFERENCE



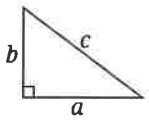
$A = \pi r^2$
$C = 2\pi r$



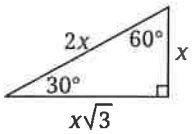
$A = \ell w$

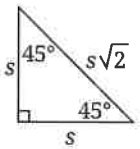


$A = \frac{1}{2}bh$

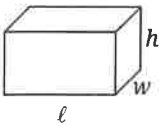


$c^2 = a^2 + b^2$

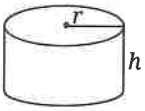




Special Right Triangles

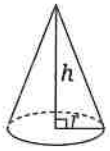


$V = \ell wh$

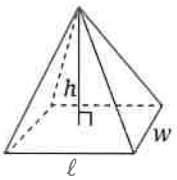


$V = \pi r^2 h$

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



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



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

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

WEEK2.2

1 Mark for Review

A data set containing only the values 2, 2, 9, 9, 9, 16, 16, 16, 16, 26, 26, and 26 is represented by a frequency table. Which of the following is the correct representation of this data set?

(A)

Number	Frequency
2	4
9	27
16	64
26	78

(B)

Number	Frequency
2	2
9	3
16	4
26	3

(C)

Number	Frequency
2	2
3	9
4	16
3	26

(D)

Number	Frequency
4	2
27	9
64	16
78	26

2 Mark for Review

The expression $x^2 - x - 56$ is equivalent to which of the following?

(A) $(x - 14)(x + 4)$

(B) $(x - 7)(x + 8)$

(C) $(x - 8)(x + 7)$

(D) $(x - 4)(x + 14)$

3 Mark for Review

A carpenter hammers 10 nails per minute and installs 7 screws per minute during a project. Which of the following equations represents the scenario if the carpenter hammers nails for x minutes, installs screws for y minutes, and uses a combined total of 200 nails and screws?

(A) $\frac{1}{10}x + \frac{1}{7}y = 200$

(B) $\frac{1}{10}x + \frac{1}{7}y = 3{,}420$

(C) $10x + 7y = 200$

(D) $10x + 7y = 3{,}420$

CONTINUE

4 Mark for Review

What is the measure of angle F in the triangle DEF, where angle D is 73° and angle E is 35°?

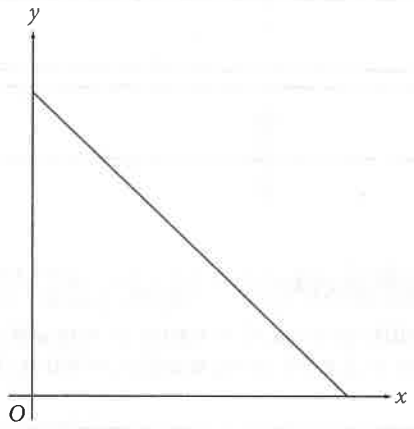
(A) 38°

(B) 72°

(C) 108°

(D) 126°

5 Mark for Review



The total amount of plastic remaining to be recycled in a facility over x shifts is represented by the graph above. Which of the following represents the y-intercept of the graph?

(A) The total amount of plastic remaining at any given time

(B) The number of shifts it will take to finish recycling the plastic

(C) The amount of plastic that is recycled per shift

(D) The initial amount of plastic to be recycled

6 Mark for Review

The table below shows the condition and subject type for 200 textbooks at a bookstore.

	Biology	Chemistry	Physics	Anatomy	Total
Used	10	25	30	15	80
New	30	25	10	55	120
Total	40	50	40	70	200

What is the probability that a textbook chosen at random will be a new textbook? (Express your answer as a decimal or fraction, not as a percent.)

7 Mark for Review

A random sample of 5,000 students out of 60,000 undergraduate students at a university were surveyed about a potential change to the registration system. According to the survey results, 75% of the respondents did not support the existing registration system, with a 4% margin of error. Which of the following represents a reasonable total number of students who did not support the existing registration system?

(A) 1,250

(B) 3,750

(C) 13,800

(D) 43,800

CONTINUE

WEEK2.2

8 Mark for Review

What is the negative solution to the equation $\frac{32}{a} = a - 4$?

9 Mark for Review

After a hot air balloon is launched from a plateau 1,000 meters above sea level, it rises at a constant rate of 750 meters per minute. Which of the following best describes the function used to model the balloon's distance above sea level over time?

(A) Increasing linear

(B) Increasing exponential

(C) Decreasing linear

(D) Decreasing exponential

10 Mark for Review

What is the x-intercept of the function $f(x) = (22)^x - 1$ when it is graphed in the xy-plane, where $y = f(x)$?

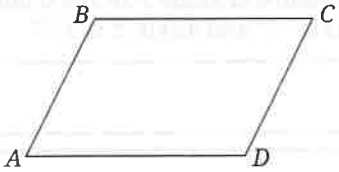
(A) $(-1, 0)$

(B) $(0, 0)$

(C) $(21, 0)$

(D) $(22, 0)$

11 Mark for Review



Note: Figure not drawn to scale.

In parallelogram $ABCD$ shown above, the length of $\overline{AB}$ is one-third the length of $\overline{AD}$. The perimeter of the parallelogram is 64. What is the length of $\overline{AB}$?

(A) 8

(B) 16

(C) 24

(D) 32

12 Mark for Review

A triangle with an area of 18 square units has a base of $(m + 5)$ units and a height of m units. What is the value of m?

(A) 4

(B) 9

(C) 13

(D) 36

CONTINUE

13 Mark for Review

Time (seconds)	Number of colonies of yeast
0	5
1	20
2	80
3	320

The table above shows the exponential growth of a type of yeast over time s, in seconds. There are c total yeast colonies on the count plate. What is the equation that represents this relationship, assuming that no yeast was added or removed after counting began?

(A) $c = (1 + 3)^s$

(B) $c = (1 + 5)^s$

(C) $c = 3(1 + 5)^s$

(D) $c = 5(1 + 3)^s$

14 Mark for Review

The equations $12x = y$ and $24x + 7 = 2y$ intersect at how many points when graphed in the xy-plane?

(A) 0

(B) 1

(C) 2

(D) 7

15 Mark for Review

Several tiles labeled with either an A or a B are placed in a bag, and tiles are worth a different point value depending on the label. The equation $15a + 10b = 100$ represents the situation when a of the A tiles and b of the B tiles are drawn from the bag for a total of 100 points. How many points would be earned by drawing one A tile and one B tile from the bag?

16 Mark for Review

The amount of money remaining in a scholarship fund is reduced by one-fourth every year. The amount of money in the fund is represented by d and the number of years by y. If the fund starts with \$10,000, which equation below represents this situation after y years?

(A) $d = \frac{1}{4}(10{,}000)^y$

(B) $d = \frac{3}{4}(10{,}000)^y$

(C) $d = 10{,}000\left(\frac{1}{4}\right)^y$

(D) $d = 10{,}000\left(\frac{3}{4}\right)^y$

CONTINUE

WEEK2.2

17 Mark for Review

What is the diameter, in millimeters (mm), of a cylinder with a volume of 144π mm^3 and a height of 4 mm?

(A) 6

(B) 9

(C) 12

(D) 36

18 Mark for Review

$$4x + 2y = 4$$
$$19x + 10y = 14$$

When graphed in the xy-plane, the linear equations shown above intersect at (a, b). What is the value of a?

(A) -20

(B) -10

(C) 6

(D) 14

19 Mark for Review

The longest side of right triangle ABC is opposite angle B. If $\sin(A) = \frac{9}{41}$, what is the value of $\sin(C)$?

20 Mark for Review

Function g reaches its maximum value when $x = a$. If $g(x) = -6x^2 - 30x - 24$, what is the value of a?

CONTINUE

21 Mark for Review

$$f(x) = -\frac{1}{5}x - 3$$

The linear function $f(x)$, given above, is perpendicular to $g(x)$ when graphed in the xy-plane. If $g(0) = 0$, what is the value of $g(2)$?

22 Mark for Review

$$y = 5kx^2 + 2x + 3$$

$$\frac{y}{10} = -x$$

The given system of equations has exactly one solution. If k is a positive constant, what is the value of k?

YIELD

Once you've finished (or run out of time for) this section, use the answer key to determine how many questions you got right. If you got fewer than 14 questions right, move on to Module 2—Easier, otherwise move on to Module 2—Harder.