Section 2, Module 1: Math

35 MINUTES, 22 QUESTIONS

DIRECTIONS ∨

- All expressions and variables use real numbers.
- All figures are drawn to scale.
- Every figure lies in a plane.
- The domain of given functions is the set of all real numbers for which the corresponding value of the function is real.

For **multiple-choice questions**, solve the problem and pick the correct answer from the provided choices. Each multiple-choice question has only one correct answer.

For **student-produced response questions,** solve each problem and enter your answer following these guidelines:

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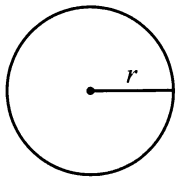
- If your answer is a **fraction** that does not fit in the given space, enter the decimal equivalent instead.
- If your answer is a **decimal** that does not fit in the given space, enter it by stopping at or rounding up at the fourth digit.
- If your answer is a **mixed number** (like $4\frac{1}{2}$), enter it as an improper fraction (9/2) or its decimal equivalent (4.5).
- Do not enter **symbols** like a comma, dollar sign, or percent sign.

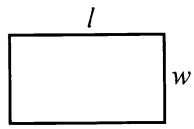
Examples

Answer	Acceptable Entries	Unacceptable Entries That Will Receive Zero Credit
4.5	4.5 4.50 9/2	$4\frac{1}{2}$ 41/2
$\frac{8}{9}$	8/9 .8888 .8889 0.888 0.889	0.88 .88 .89 0.89
$-\frac{1}{9}$	−1/9 −.1111 −0.111	−.11 −0.11

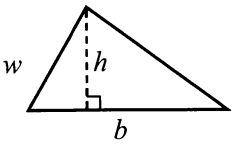
REFERENCE ∨



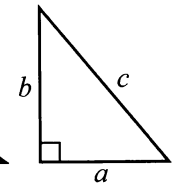
$A = \pi r^2$
$C = 2\pi r$



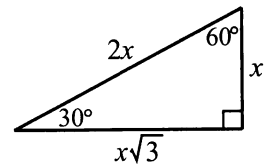
$A = lw$

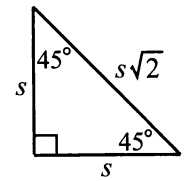


$A = \frac{1}{2}bh$

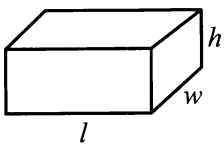


$c^2 = a^2 + b^2$

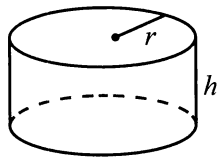




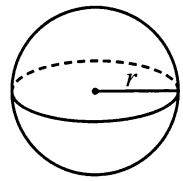
Special Right Triangles



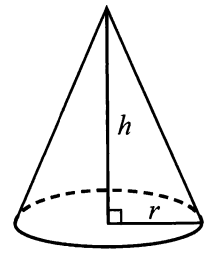
$V = lwh$



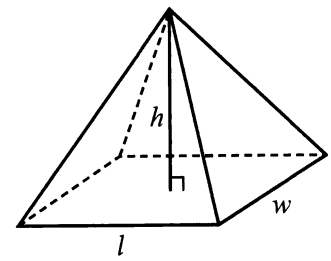
$V = \pi r^2 h$



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



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



$V = \frac{1}{3}lwh$

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.

2 MODULE 1 2

1

If $x = 5$, what is $3(x + 2) - 2x$?

Ⓐ 5
Ⓑ 9
Ⓒ 11
Ⓓ 13

2

$-3(x^2 - 2x + 4)$ is equivalent to which of the following expressions?

Ⓐ $-3x^2 - 6x + 12$
Ⓑ $-3x^2 - 6x - 12$
Ⓒ $-3x^2 - 6x + 12$
Ⓓ $-3x^2 + 6x - 12$

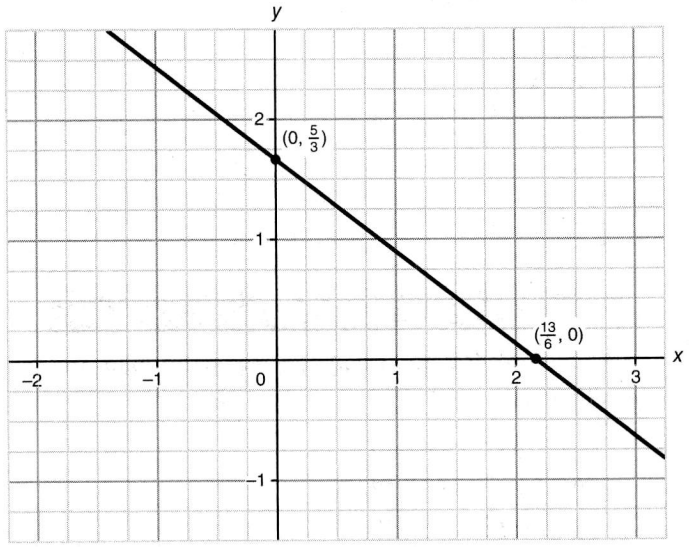
3

Letter Grade	Percentage of Students with That Grade
A (90–100%)	26
B (80–99%)	33
C (70–79%)	21
D (60–69%)	13
F (<60%)	7

The table above presents the percentage of students in a class with particular letter grades. What letter grade is the median grade for the class?

Ⓐ A
Ⓑ B
Ⓒ C
Ⓓ D

4



What is the slope of the line in the above graph in the xy-coordinate plane?

Ⓐ $-\frac{13}{4}$

Ⓑ $-\frac{10}{13}$

Ⓒ $-\frac{1}{3}$

Ⓓ $\frac{7}{4}$

5

What is the product of the solutions to the equation $0 = \left(x + \frac{1}{4}\right)\left(x - \frac{2}{3}\right)$?

Ⓐ $-\frac{1}{12}$

Ⓑ $-\frac{1}{6}$

Ⓒ $\frac{1}{4}$

Ⓓ $\frac{5}{12}$

2 MODULE 1 2

6

At a certain college, 27% of all students majored in science or mathematics. If there were a total of 4,000 students at the college, how many of the students would have a science or mathematics major?

Ⓐ 1,080
Ⓑ 2,920
Ⓒ 14,815
Ⓓ 108,000

7

Mark consistently sleeps for 8 hours per day. Which expression gives the number of hours that Mark would sleep in W weeks?

Ⓐ $56 \times W$
Ⓑ $8 \times W$
Ⓒ $8 + W$
Ⓓ $56 + W$

8

If $x^3 = \frac{27}{8}$, what is the value of x?

Ⓐ $\frac{1}{3}$
Ⓑ $\frac{3}{4}$
Ⓒ $\frac{3}{2}$
Ⓓ $\frac{9}{4}$

9

$$B = 2P + 3E$$

A bagel store charges \$2 for each plain bagel, P, and \$3 for each everything bagel, E. The equation above represents the total amount, B, that Samantha paid for a box of bagels. If the box cost a total of \$40 and Samantha purchased 4 everything bagels, how many plain bagels did she purchase?

10

A circle with an original area of 16π units increases in area by 56.25%. What is the radius of the new circle?

Ⓐ 5 units
Ⓑ 6 units
Ⓒ 10 units
Ⓓ 25 units

11

$$3x - 4y = -2$$
$$x + y = 11$$

Given that (x, y) is a solution to the above system of equations, what is the value of x?

12

If the city of Detroit has a population of 4,900 persons per square mile, and there are 139 square miles of land within the city, what would most closely approximate the total population of the city?

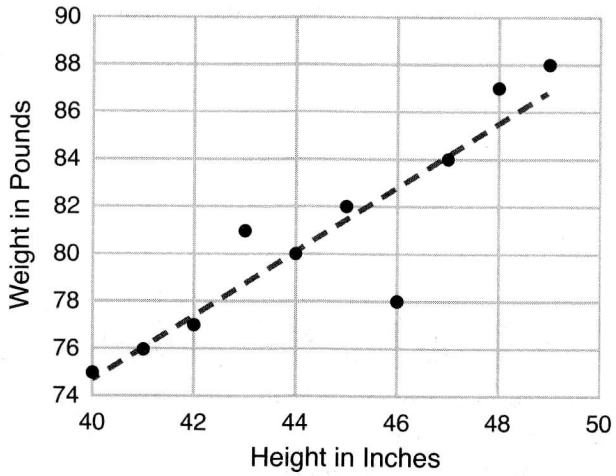
Ⓐ 35,000
Ⓑ 47,000
Ⓒ 681,000
Ⓓ 1,240,000

13

If $\frac{x^2 - 4}{3} = 7$ and $x - 2 = 3$, what is the value of $x + 2$?

2 MODULE 1 2

14



The height in inches and weight in pounds for several female orangutans is graphed in the scatterplot above. Based on the data in the graph, which of these statements best summarizes the overall trend in the data?

Ⓐ The greater the height of the orangutan, the greater the weight.
Ⓑ The lower the height of the orangutan, the greater the weight.
Ⓒ The greater the height of the orangutan, the lower the weight.
Ⓓ The height and the weight of the orangutan are equivalent throughout the set of data.

15

A cylindrical tank has base with a diameter of 10 feet and a volume of 300π cubic feet. What is the height of this tank in feet?

Ⓐ 8
Ⓑ 10
Ⓒ 12
Ⓓ 16

16

If the function $f(x) = \frac{x^2 + 3}{2x}$ when $x \neq 0$, what is the value of $f(6)$?

Ⓐ $-\frac{7}{3}$

Ⓑ $\frac{2}{9}$

Ⓒ 1

Ⓓ $\frac{13}{4}$

17

After a presidential debate, viewers could go to an online poll and vote for which of the two candidates they thought won the debate. Approximately 2,500 viewers chose to fill out responses. Would the results from the online poll provide an accurate representation of opinions of all likely voters as to whom they thought won the debate?

Ⓐ Yes, because the sample of viewers was random.

Ⓑ Yes, because the number of respondents was sufficiently large.

Ⓒ No, because the respondents were self-selected instead of randomly selected.

Ⓓ No, because the number of respondents was insufficient.

18

x	y
2	5
6	15
10	25

The relationship between the values in the table above can be expressed as the function $y = kx$, in which k is a constant value. What is the value of k?

2 MODULE 1 2

19

In the xy-plane, which of these equations would represent the graph of $y = x^2 - 4$ shifted upward five units?

Ⓐ $y = x^2 - 5$
Ⓑ $y = x^2 - 1$
Ⓒ $y = x^2 + 1$
Ⓓ $y = 5x^2 - 4$

20

$$y \geq x + n$$

When the ordered pair $(2, 5)$ is a solution for (x, y) in the inequality above, what is the greatest possible value for n?

Ⓐ 3
Ⓑ 5
Ⓒ 8
Ⓓ 12

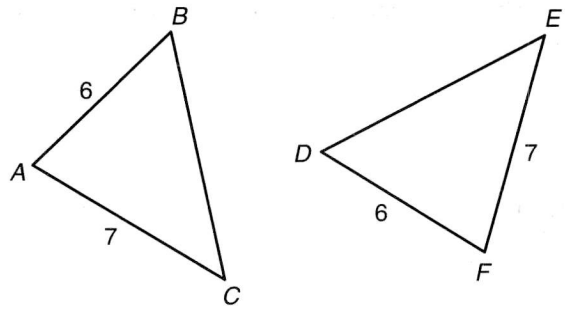
21

	Actually Has Illness	Actually Does Not Have Illness
Positive Test Result	5	20
Negative Test Result	0	800

If a randomly selected patient who participated in the study with the results given above has a positive test result (i.e., the test indicates that someone has an illness), what is the probability that the result is a *false* positive?

Ⓐ 0.5
Ⓑ 0.8
Ⓒ 0.9
Ⓓ 1.2

22



Triangles *ABC* and *DEF* both have sides of length 6 and 7 as shown above. Which of the following would, if true, be sufficient to prove that the triangles are congruent?

Ⓐ That angle *BAC* equals angle *DEF*
Ⓑ That angle *CBA* equals angle *EDF*
Ⓒ That angle *BAC* equals angle *DFE*
Ⓓ That angle *ABC* equals angle *FED*

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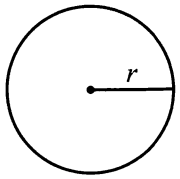

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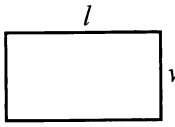

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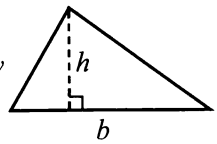

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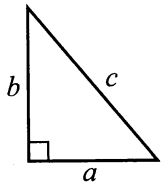

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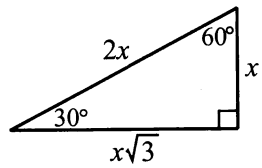

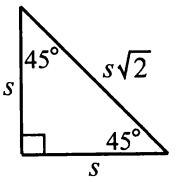

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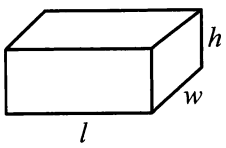

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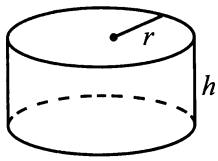

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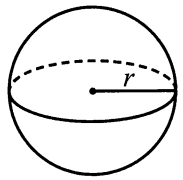

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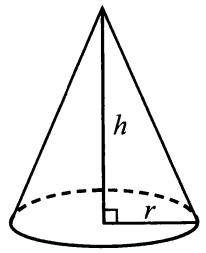
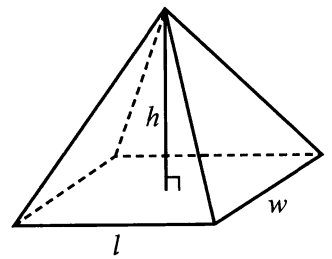


$V = \frac{1}{3}\pi r^2 h$



$V = \frac{1}{3}lwh$

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.

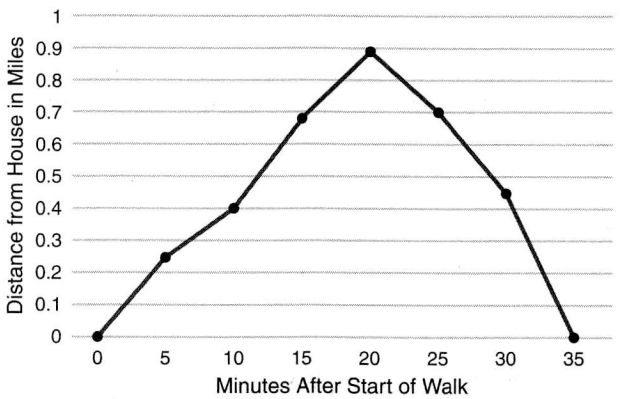
2 MODULE 2 2

1

If $5x + 2 = 4(x - 3)$, what is the value of x?

Ⓐ -14
Ⓑ -11
Ⓒ -7
Ⓓ 3

2



Tyrese takes a walk around his neighborhood. The distance he is in miles from his house at a particular number of minutes after beginning his walk is represented in the graph above. At what interval of time in his walk did the distance he is from his house decrease most rapidly?

Ⓐ 0–5 minutes
Ⓑ 15–20 minutes
Ⓒ 25–30 minutes
Ⓓ 30–35 minutes

3

If $\frac{1}{3}(x - 2) = y$ and $x = 5$, what is the value of y?

4

If a line has a slope of 5 and a y-intercept of k, what is the value of k if the points $(1, 8)$ and $(3, 18)$ are in the line?

Ⓐ 3
Ⓑ 5
Ⓒ 9
Ⓓ 24

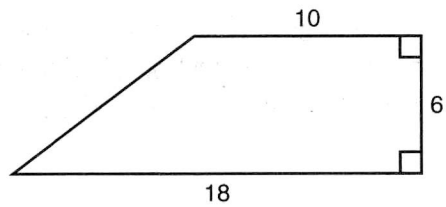
5

$$\frac{x^2 - 9}{x - 3}$$

Which of the following is equivalent to the above expression, in which $x \neq 3$?

Ⓐ $x^2 - 2$
Ⓑ $x^3 - 1$
Ⓒ $x - 9$
Ⓓ $x + 3$

6



How many units is the perimeter of the above trapezoid?

2 MODULE 2 2

7

A fruit stand charges a different amount depending on the number of pieces of fruit in a box:

Number of Pieces of Fruit in the Box	Cost of Box
6	$13.40
12	$25.40
20	$41.40
32	$65.40

What function could be used to determine the total cost, C, of a box that has x pieces of fruit?

Ⓐ $C(x) = -x + 2.40$
Ⓑ $C(x) = 2x + 1.40$
Ⓒ $C(x) = 1.4x + 3$
Ⓓ $C(x) = 2.8x + 1$

8

Kinetic energy, K, is calculated using the following formula, in which m = mass, and v = velocity.

$$K = \frac{1}{2}mv^2$$

What is the velocity in terms of the other variables?

Ⓐ $v = 2Km$
Ⓑ $v = \sqrt{\frac{2K}{m}}$
Ⓒ $v = \sqrt{\frac{2m}{K}}$
Ⓓ $v = 2m^2\sqrt{K}$

9

A data set of 15 different numbers has a median of 25 and a mean of 30. If the smallest member of the set has 5 subtracted from it and the largest member has 20 added to it, while all the other elements remain the same, which of these is a correct statement?

Ⓐ The standard deviation of the set changes more than the range of the set
Ⓑ The range of the set changes more than the standard deviation of the set.
Ⓒ The range of the set remains the same.
Ⓓ The standard deviation of the set remains the same.

2 MODULE 2 2

10

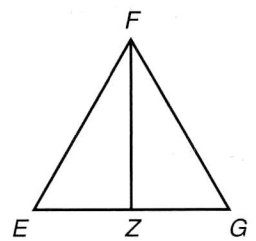
Consider the sum of the expressions $-x^2 + 4x - 3$ and $5x^2 - 2x + 8$. If the sum is written in the form $gx^2 + hx + k$, where g, h, and k are constants, what is the value of k?

Ⓐ 1
Ⓑ 3
Ⓒ 4
Ⓓ 5

11

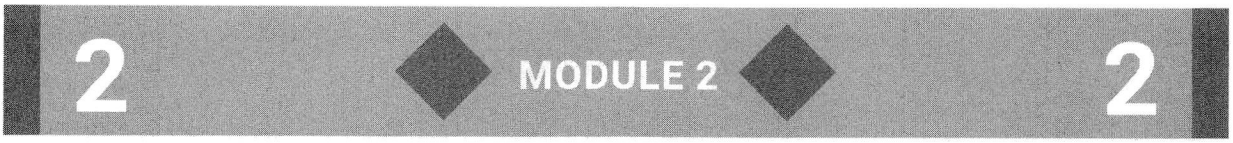
In the xy-plane, a line passes through the points $(5, 0)$ and $(0, 3)$. Another line is perpendicular to this line. What would be this perpendicular line's slope?

12



Triangle EFG is equilateral. If $\overline{EF}$ is 10 units long, and $\angle EFZ$ is 30°, what is the length of $\overline{FZ}$?

Ⓐ $5\sqrt{3}$
Ⓑ $5\sqrt{2}$
Ⓒ 10
Ⓓ $10\sqrt{2}$



13

A particular multivitamin provides 300 mg of calcium, giving 23% of the recommended daily value of calcium for an adult. If another multivitamin provides 210 mg of calcium, approximately what percentage of a recommended daily value of calcium for an adult would it provide, to the nearest whole percent?

Ⓐ 8%
Ⓑ 16%
Ⓒ 20%
Ⓓ 44%

14

The measure of an angle is $\frac{2}{3}\pi$ radians. How many angles of this measure would be equivalent to 360 degrees?

15

For the system of inequalities $y \leq x + 2$ and $y \leq -x + 4$, when y is at its greatest possible value, what is the corresponding value of x?

Ⓐ -6
Ⓑ -2
Ⓒ 1
Ⓓ 4

16

x	y
1	2
2	$\frac{1}{2}$
3	$\frac{2}{9}$
4	$\frac{1}{8}$
5	$\frac{2}{25}$

Which function expresses the relationship between x and y?

Ⓐ $y = \frac{2}{x^2}$

Ⓑ $y = \frac{4}{x^2}$

Ⓒ $y = \frac{1}{2}x^2$

Ⓓ $y = \frac{1}{6}x^3$

17

What is the result when $4x^2 - 3x + 2$ is divided by $x - 3$?

Ⓐ $4x - 9$

Ⓑ $12x^2 + 9$

Ⓒ $2x - 3 + \frac{1}{(x-3)}$

Ⓓ $4x + 9 + \frac{29}{(x-3)}$

18

$$y = x(x-4)^2(x+3)^2$$

In the above equation, how many unique x-intercepts does the graph of the function have?

Ⓐ 0

Ⓑ 1

Ⓒ 3

Ⓓ 5

2 MODULE 2 2

19

	Bus	Walk	Total
Elementary	a	b	c
Middle	d	e	f
Total	80	70	150

Consider the information in the table above with the variables representing numerical values. There are twice as many elementary school students as there are middle school students, and 60% of elementary school students take the bus. How many middle school students walk to school?

Ⓐ 20
Ⓑ 30
Ⓒ 40
Ⓓ 60

20

What values of x would make the product of $\frac{2}{x}$ and $\frac{3}{(x-1)}$ undefined?

Ⓐ 0 only
Ⓑ -1 only
Ⓒ 0 and 1 only
Ⓓ -1 and 0 only

21

For a parabola with the equation $y = 7(x-5)(x+2)$, what is the distance between the x intercepts of the parabola?

22

If $(x+5)(x+3) = ax^2 + bx + c$, in which a, b, and c are all constants, what is the value of c?

ANSWER KEY
Practice Test 1

Section 1, Module 1: Reading and Writing

1. **D**	10. **B**	19. **A**
2. **C**	11. **C**	20. **B**
3. **B**	12. **D**	21. **C**
4. **C**	13. **B**	22. **C**
5. **D**	14. **D**	23. **A**
6. **C**	15. **C**	24. **D**
7. **B**	16. **A**	25. **A**
8. **B**	17. **D**	26. **C**
9. **D**	18. **D**	27. **B**

Section 1, Module 2: Reading and Writing

1. **D**	10. **B**	19. **C**
2. **A**	11. **C**	20. **A**
3. **C**	12. **D**	21. **C**
4. **B**	13. **C**	22. **A**
5. **A**	14. **B**	23. **C**
6. **B**	15. **D**	24. **B**
7. **A**	16. **C**	25. **B**
8. **B**	17. **B**	26. **B**
9. **A**	18. **D**	27. **A**

ANSWER KEY
Practice Test 1

Section 2, Module 1: Math

1. **C**
2. **D**
3. **B**
4. **B**
5. **B**
6. **A**
7. **A**
8. **C**
9. **14**
10. **A**
11. **6**
12. **C**
13. **7**
14. **A**
15. **C**
16. **D**
17. **C**
18. **2.5 or $\frac{5}{2}$**
19. **C**
20. **A**
21. **B**
22. **C**

Section 2, Module 2: Math

1. **A**
2. **D**
3. **1**
4. **A**
5. **D**
6. **44**
7. **B**
8. **B**
9. **B**
10. **D**
11. **1.666, 1.667, or $\frac{5}{3}$**
12. **A**
13. **B**
14. **3**
15. **C**
16. **A**
17. **D**
18. **C**
19. **B**
20. **C**
21. **7**
22. **15**

Digital SAT Scoring Chart

This will give you an approximation of the score you would earn on the Digital SAT.[1] Tally the number of correct answers from the Reading and Writing section (out of 54) and the Math section (out of 44). Take the total for each of these and find the corresponding section score in the tables below.

Number of Correct Reading and Writing Questions (Out of 54)	Reading and Writing Test Score (Out of 800)
0	200
1	210
2	220
3	230
4	240
5	250
6	260
7	270
8	280
9	290
10	300
11	310
12	330
13	340
14	350
15	360
16	380
17	390
18	400
19	410
20	430
21	440
22	460
23	470
24	490
25	500
26	510
27	520

Number of Correct Reading and Writing Questions (Out of 54)	Reading and Writing Test Score (Out of 800)
28	530
29	540
30	550
31	560
32	570
33	580
34	590
35	600
36	610
37	620
38	630
39	640
40	650
41	660
42	670
43	680
44	690
45	700
46	710
47	720
48	730
49	740
50	750
51	760
52	770
53	790
54	800

[1] Keep in mind that some of the questions on an actual SAT test will be research questions that will not count towards your actual score. For the sake of simplicity, we are including possible research questions in your calculation.

Number of Correct Math Questions (Out of 44)	Math Section Score (Out of 800)
0	200
1	220
2	230
3	240
4	250
5	280
6	300
7	320
8	340
9	350
10	360
11	380
12	390
13	400
14	410
15	430
16	440
17	450
18	460
19	480
20	490
21	500
22	510

Number of Correct Math Questions (Out of 44)	Math Section Score (Out of 800)
23	520
24	530
25	540
26	550
27	560
28	570
29	580
30	590
31	600
32	610
33	620
34	630
35	650
36	660
37	680
38	690
39	700
40	720
41	750
42	770
43	790
44	800

Add the Reading and Writing section score and the Math section score to find your total SAT test score:

_____ Reading and Writing Section Score +

_____ Math Section Score =

_____ **Total SAT Test Score (between 400 and 1600)**

Approximate your testing percentiles (1st to 99th) using this chart:[2]

Total Score	Section Score	Total Percentile	Reading and Writing Percentile	Math Percentile
1600	800	99+	99+	99
1500	750	98	98	96
1400	700	94	94	91
1300	650	86	86	84
1200	600	74	73	75
1100	550	59	57	61
1000	500	41	40	42
900	450	25	24	27
800	400	11	11	15
700	350	3	3	5
600	300	1	1	1
500	250	1	1	1
400	200	1	1	1

[2] Scoring Data based on information at *collegeboard.org*