April 2019

Math Tests

The SAT®

Question-and-Answer Service

Use this with your QAS Student Guide and personalized QAS Report.

What's inside:
The SAT and SAT Essay administered on your test day

CollegeBoard

Math Test – No Calculator

25 MINUTES, 20 QUESTIONS

Turn to Section 3 of your answer sheet to answer the questions in this section.

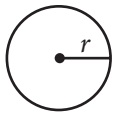
DIRECTIONS

For questions 1-15, solve each problem, choose the best answer from the choices provided, and fill in the corresponding bubble on your answer sheet. **For questions 16-20**, solve the problem and enter your answer in the grid on the answer sheet. Please refer to the directions before question 16 on how to enter your answers in the grid. You may use any available space in your test booklet for scratch work.

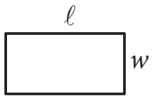
NOTES

1. The use of a calculator **is not permitted**.
2. All variables and expressions used represent real numbers unless otherwise indicated.
3. Figures provided in this test are drawn to scale unless otherwise indicated.
4. All figures lie in a plane unless otherwise indicated.
5. Unless otherwise indicated, the domain of a given function f is the set of all real numbers x for which $f(x)$ is a real number.

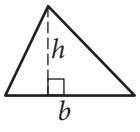
REFERENCE



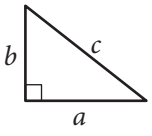
$A = \pi r^2$
$C = 2\pi r$



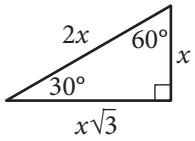
$A = \ell w$

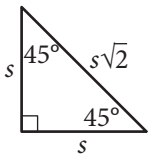


$A = \frac{1}{2}bh$

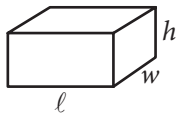


$c^2 = a^2 + b^2$

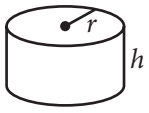




Special Right Triangles

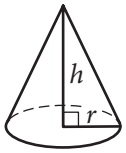


$V = \ell wh$

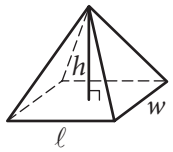


$V = \pi r^2 h$

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



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



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

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

1

Juliet rented a car for one day from a company that charges $80 per day plus $0.15 per mile driven. If she was charged a total of $98 for the rental and mileage, for how many miles of driving was Juliet charged? (Assume there is no tax.)

A) 15
B) 120
C) 533
D) 633

2

$$(2x + 6) + (x^2 + 2x + 1)$$

Which of the following polynomials is equivalent to the expression above?

A) $x^2 + 5$
B) $x^2 + 7$
C) $4x^2 + 7$
D) $x^2 + 4x + 7$

3

$$f(x) = 2(x - 1) + 2$$

For the function f defined above, what is the value of $f(1)$?

A) 3
B) 2
C) 0
D) -1

4

Which of the following is an equation of the line in the xy-plane that has slope 2 and passes through the point $(0, 3)$?

A) $y = 2x + 3$
B) $y = 2x - 3$
C) $y = 2(x + 3)$
D) $y = 2(x - 3)$

5

$$\sqrt{x} + 4 = 12$$

Which of the following is the solution to the equation above?

A) 8
B) 16
C) 64
D) 140

CONTINUE

6

If $7(2x-5)-2(2x-5)=4(x+5)$, what is the value of x ?

A) 1

B) $\frac{15}{2}$

C) $\frac{65}{6}$

D) 65

7

$$x^4-8x^2+16$$

Which of the following is equivalent to the expression above?

A) $(x-2)^2(x+2)^2$

B) $(x^2+4)(x+2)(x-2)$

C) $(x-2)^4$

D) $(x-4)^4$

8

$$V=\frac{M}{D}$$

The formula above relates volume V, mass M, and density D. What is density in terms of volume and mass?

A) $D=\frac{1}{MV}$

B) $D=\frac{M}{V}$

C) $D=\frac{V}{M}$

D) $D=MV$

9

For a ride, a taxi driver charges an initial fare of \$3.00 plus \$0.40 for each $\frac{1}{5}$ of a mile driven. If the total charge for a ride is \$27.00, what is the distance traveled, in miles?

A) 3

B) 8

C) 12

D) 15

CONTINUE

10

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

Torricelli's law is given by the equation above, where m represents the mass, h represents the height, v represents the velocity, and g is a constant. According to the equation from Torricelli's law, which of the following is equivalent to the velocity, v ?

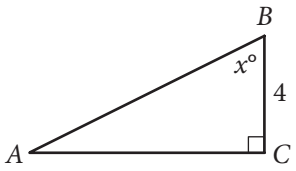
A) $2gh$

B) $\frac{1}{2}ghm^2$

C) $\sqrt{2gh}$

D) $\sqrt{\frac{1}{2}mgh}$

11



Note: Figure not drawn to scale.

In the right triangle above, $x = 60$. What is the length of side $\overline{AB}$?

A) 7

B) 8

C) 9

D) It cannot be determined from the information given.

12

$$4v^2 + 6v + 1 = 0$$

Which of the following values is a solution to the equation above?

A) $\frac{-3 + \sqrt{5}}{4}$

B) $\frac{-3 + \sqrt{13}}{4}$

C) $\frac{3 + \sqrt{5}}{4}$

D) $\frac{3 + \sqrt{13}}{4}$

13

$$C(t) = 50.25t + 228.75$$

The average cost per square foot, in dollars, of a condominium in City X can be modeled by the function C defined above, where t is the number of years after 2001 and $0 \le t \le 8$. In the function, what does the number 50.25 represent?

A) The average cost per square foot, in dollars, of a condominium in 2001

B) The average cost per square foot, in dollars, of a condominium in 2009

C) The approximate increase in years for each dollar increase in the average cost per square foot of a condominium

D) The approximate increase in the average cost per square foot, in dollars, of a condominium for each additional year after 2001

CONTINUE

14

What is the sum of the complex numbers $6 + 5i$ and $8 + 3i^2$? (Note: $i = \sqrt{-1}$)

A) $11 + 5i$

B) $14 - 2i$

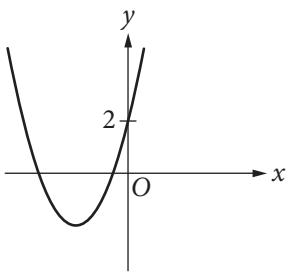
C) $14 + 8i^3$

D) $17 + 5i$

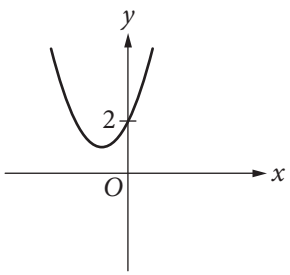
15

Which of the following could be the graph of $y = x^2 + 2x + 2$?

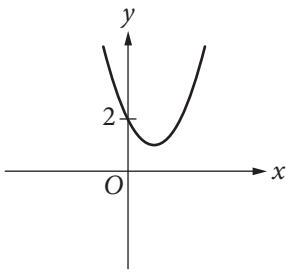
A)



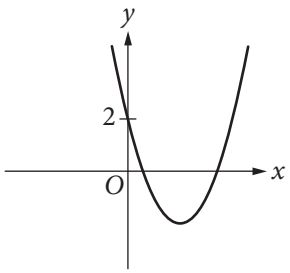
B)



C)



D)

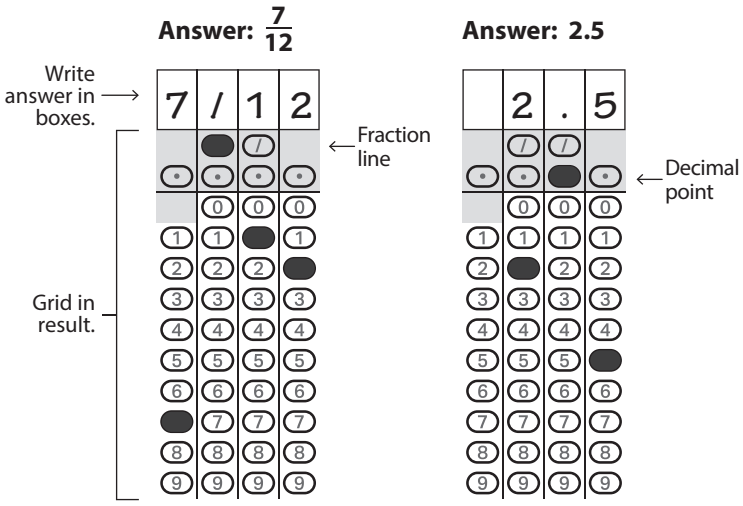


CONTINUE

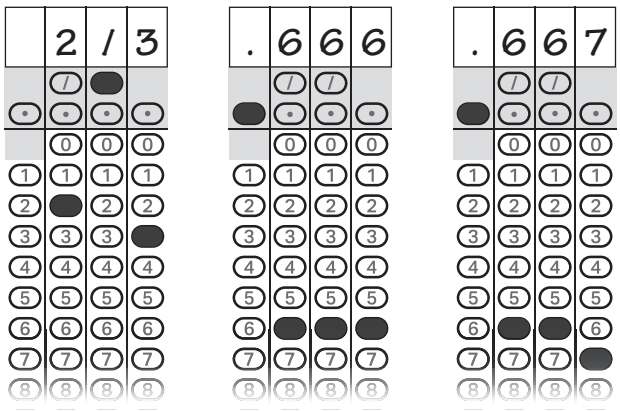
DIRECTIONS

For questions 16-20, solve the problem and enter your answer in the grid, as described below, on the answer sheet.

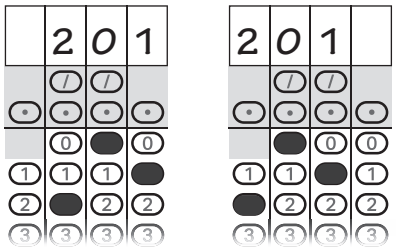
1. Although not required, it is suggested that you write your answer in the boxes at the top of the columns to help you fill in the bubbles accurately. You will receive credit only if the bubbles are filled in correctly.
2. Mark no more than one bubble in any column.
3. No question has a negative answer.
4. Some problems may have more than one correct answer. In such cases, grid only one answer.
5. **Mixed numbers** such as $3\frac{1}{2}$ must be gridded as 3.5 or 7/2. (If  is entered into the grid, it will be interpreted as $\frac{31}{2}$, not $3\frac{1}{2}$.)
6. **Decimal answers:** If you obtain a decimal answer with more digits than the grid can accommodate, it may be either rounded or truncated, but it must fill the entire grid.



Acceptable ways to grid $\frac{2}{3}$ are:



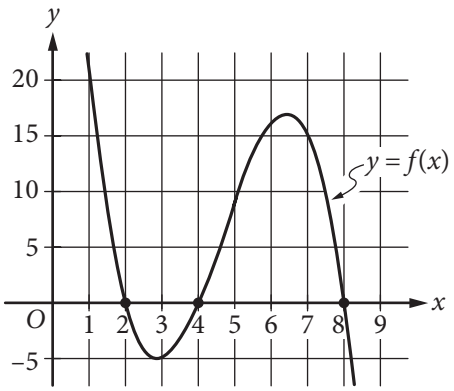
Answer: 201 – either position is correct



NOTE:
You may start your answers in any column, space permitting. Columns you don't need to use should be left blank.

CONTINUE

16



The graph of the cubic function f is shown in the xy-plane above. If $f(a) = 0$, where a is a constant, what is one possible value of a ?

17

$$5(x + a) + 3(x^2 - a) = 3x^2 + 5x + 4$$

In the equation above, a is a constant. If the equation is true for all values of x, what is the value of a ?

18

$$3m + 2p = 24$$
$$m + p = 10$$

If (m_1, p_1) is the solution to the system of equations above, what is the value of p_1 ?

19

$$4x - 5y = 2$$

The graph of the equation above in the xy-plane is a line. What is the x-coordinate of the x-intercept of the line?

20

$$(x - 6)^2 + (y - 3)^2 = 25$$

The graph in the xy-plane of the equation above is a circle. If the circle is translated downward a units such that the circle is tangent to the x-axis, the equation becomes $(x - 6)^2 + (y - 3 + a)^2 = 25$. What is the value of a ?

STOP

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

Math Test – Calculator

55 MINUTES, 38 QUESTIONS

Turn to Section 4 of your answer sheet to answer the questions in this section.

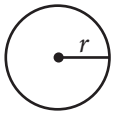
DIRECTIONS

For questions 1-30, solve each problem, choose the best answer from the choices provided, and fill in the corresponding bubble on your answer sheet. **For questions 31-38**, solve the problem and enter your answer in the grid on the answer sheet. Please refer to the directions before question 31 on how to enter your answers in the grid. You may use any available space in your test booklet for scratch work.

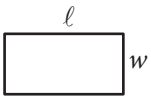
NOTES

1. The use of a calculator **is permitted**.
2. All variables and expressions used represent real numbers unless otherwise indicated.
3. Figures provided in this test are drawn to scale unless otherwise indicated.
4. All figures lie in a plane unless otherwise indicated.
5. Unless otherwise indicated, the domain of a given function f is the set of all real numbers x for which $f(x)$ is a real number.

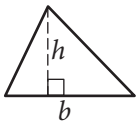
REFERENCE



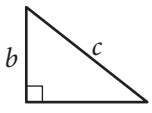
$A = \pi r^2$
$C = 2\pi r$



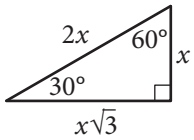
$A = \ell w$

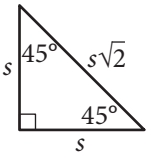


$A = \frac{1}{2}bh$

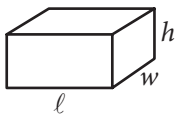


$c^2 = a^2 + b^2$

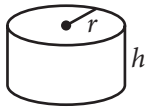




Special Right Triangles

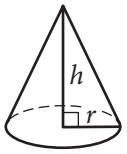


$V = \ell wh$

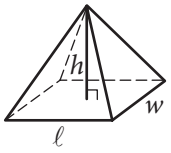


$V = \pi r^2 h$

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



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



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

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.

1

$$5(x-3) = 10x + 5$$

What value of x satisfies the equation above?

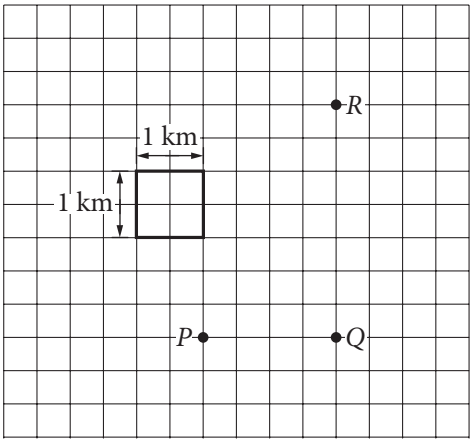
A) -4

B) 1

C) 5

D) 15

2



A student walks x kilometers (km) along a straight path from point P to point Q. Then the student walks y km along a straight path from point Q to point R. What is the total distance, $x + y$, in km, that the student walks?

A) 2.0

B) 3.5

C) 5.5

D) 8.0

3

If $y = x + \frac{1}{2}$ and $z = 2x - 3$, which of the following is equivalent to $y + yz$?

A) $2x^2 - x - 1$

B) $2x^2 - x - 2$

C) $2x^2 - x - \frac{1}{2}$

D) $2x^2 - 2x - \frac{3}{2}$

4

An electric company charges Jerome \$0.05 per kilowatt-hour (kWh) of energy he uses in his house. If Jerome was charged \$36 by the electric company, how many kilowatt-hours of energy did Jerome use?

A) 0.0014

B) 1.8

C) 180

D) 720

CONTINUE

5

A scientist conducted an experiment and selected a random sample of runners from a list of all high school track participants from a certain city. The scientist randomly assigned each runner to one of two treatment groups, and the results of the experiment were found to be statistically significant. To which of the following populations can the results of the experiment be safely generalized?

A) All high school athletes
B) All high school track participants from the city
C) All high school track participants from the country
D) All runners

6

Which of the following equivalent forms of the function $f(x) = 4x^2 + 4x - 24$ is the most suitable to indicate the x-coordinates of the x-intercepts of the graph of $y = f(x)$ in the xy-plane?

A) $f(x) = 4(x^2 + x - 6)$
B) $f(x) = 4(x - 2)(x + 3)$
C) $f(x) = 2(x - 2)(2x + 6)$
D) $f(x) = (2x - 4)(2x + 6)$

7

Raymond's weekly income consists of a base salary for a 40-hour workweek plus overtime pay. The overtime pay is paid at an hourly rate for the time that Raymond works in addition to his 40-hour workweek. Raymond's weekly income, in dollars, can be represented by the expression $800 + 30x$, where x is the total number of hours Raymond works over 40 hours. Which of the following is the best interpretation of the number 800 in this context?

A) Raymond's base weekly salary, in dollars
B) Raymond's total overtime pay for the workweek, in dollars
C) The total number of hours in a year that Raymond works in addition to his normal 40-hour workweeks
D) Raymond's hourly wage, in dollars per hour, for time worked in addition to his normal 40-hour workweek

8

A city with 120,000 residents is voting on a proposal that would eliminate overnight parking of vehicles on the city's streets. An independent company randomly surveys 1,200 residents to see whether or not residents would support this proposal. The outcome of the survey shows that 60% of the residents surveyed approve of the proposal with a margin of error of 2%. Which of the following statements is a plausible conclusion from the outcome of the survey?

A) Exactly 60% of city residents approve eliminating overnight parking.
B) There are 72,000 city residents who approve eliminating overnight parking.
C) About 2% of the city residents do not approve eliminating overnight parking.
D) Between 58% and 62% of the city residents approve eliminating overnight parking.

CONTINUE

9

On November 1st, there were 2,500 boxes in a warehouse. On December 1st, there were 15% fewer boxes in the warehouse than there were on November 1st. On January 1st, there were 20% more boxes in the warehouse than there were on December 1st. How many boxes were in the warehouse on January 1st?

A) 1,700

B) 2,125

C) 2,550

D) 2,625

10

Jonathan needs to earn at least $175 next week and can work at most 20 hours. He earns $10 per hour at his lawn service job and $8 per hour at his job at the gym. Which of the following systems of inequalities represents this situation in terms of the number of hours he will work at his lawn service job, ℓ, and the number of hours he will work at his job at the gym, g, next week?

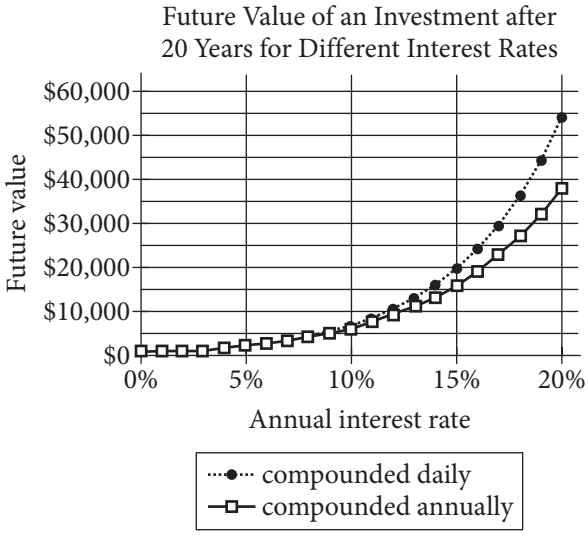
A) $10\ell + 8g \leq 175$
$\ell + g \leq 20$

B) $10\ell + 8g \leq 175$
$\ell + g \geq 20$

C) $10\ell + 8g \geq 175$
$\ell + g \leq 20$

D) $10\ell + 8g \geq 20$
$\ell + g \geq 175$

11



An initial investment of $1,000 is made at a constant annual interest rate. The graphs above show the corresponding future value v, in dollars, of the investment for different annual interest rates, r, after 20 years. One graph shows the value when the interest is compounded daily, and the other graph shows the value when the interest is compounded annually. Which of the following statements is true?

A) As r increases at a constant rate, v increases more rapidly if interest is compounded annually rather than daily.

B) As r increases at a constant rate, v increases more rapidly if interest is compounded daily rather than annually.

C) As r increases at a constant rate, the difference in interest compounded daily and interest compounded annually increases at a constant rate.

D) If $r = 15\%$ and interest is compounded annually, a $1,000 investment will be worth $20,000 after 20 years.

CONTINUE

Questions 12-14 refer to the following information.

For gym class, Shayla completed a 4-mile walking and running exercise. She ran for $7t$ miles and she walked for $3\left(\frac{13}{15} - t\right)$ miles, where t is the total amount of time, in hours, Shayla spent running. The equation $7t + 3\left(\frac{13}{15} - t\right) = 4$ models this situation.

12

Which of the following is the best interpretation of the value 7 in the equation that models this situation?

A) Shayla walked at a speed of 7 miles per hour.
B) Shayla ran at a speed of 7 miles per hour.
C) Shayla walked for 7 minutes.
D) Shayla ran for 7 minutes.

13

What is the value of t in the equation that models this situation?

A) $\frac{7}{50}$
B) $\frac{7}{20}$
C) $\frac{31}{60}$
D) $\frac{13}{15}$

14

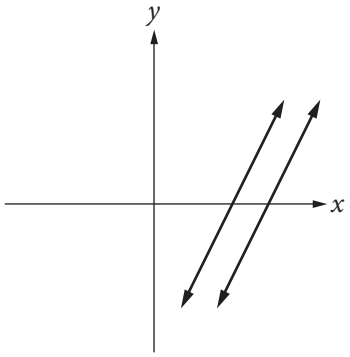
What was the total distance that Shayla spent walking and running, in kilometers?
(Use 1 mile = 1.61 kilometers)

A) 0.40
B) 4.00
C) 6.44
D) 10.53

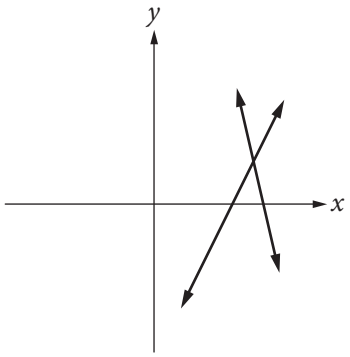
15

Which of the following is a graph of a system of equations with no solution?

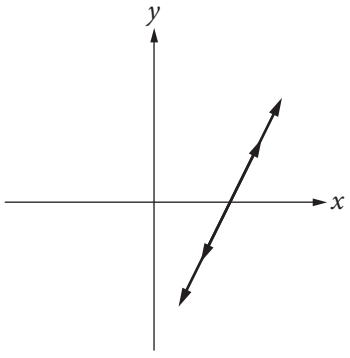
A)



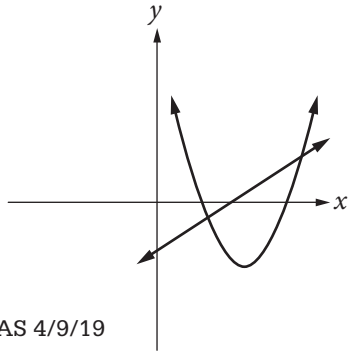
B)



C)



D)



April QAS 4/9/19

16

$$P = P_0 + \rho gh$$

The equation above gives the total pressure, P, on an object submerged in a fluid, where P_0 is the pressure at the fluid's surface, ρ is the density of the fluid, g is the acceleration due to gravity, and h is the depth to which the object is submerged. What is h in terms of P, P_0, ρ, and g ?

A) $\dfrac{\rho g}{P - P_0}$

B) $\dfrac{P - P_0}{\rho g}$

C) $\dfrac{P + P_0}{\rho g}$

D) $P + P_0 + \rho g$

17

If $4x^2 + bx + 9 = 0$, where b is a constant, has exactly one solution, what is a possible value of b ?

A) 72

B) 36

C) 12

D) 6

CONTINUE

18

	Female	Male	Total
Blue eyes	2	4	6
Brown eyes	8	6	14
Green eyes	1	5	6
Total	11	15	26

Sierra recorded the gender and eye color of all the students in her biology class. The results are shown in the table above. If a male student is selected at random from Sierra's biology class, what is the probability that he will have brown eyes?

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

B) $\frac{2}{5}$

C) $\frac{3}{7}$

D) $\frac{3}{13}$

19

Kelly enlarged the area of a photograph to 250% of its original size. The original dimensions of the photograph were 5 inches by 7 inches. What is the area of the enlarged photograph, in square inches?

A) 71.25

B) 87.5

C) 218.75

D) 3,000

20

$$\sqrt{x-3} = 3 - \sqrt{x}$$

If x is the solution to the equation above, what is the value of $\sqrt{x-3}$?

A) 1

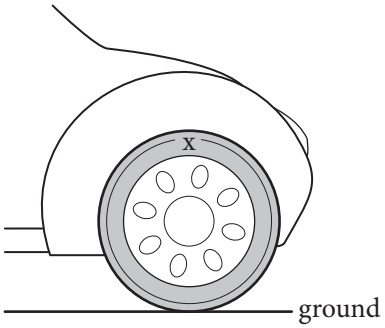
B) $\sqrt{\frac{3}{2}}$

C) $\sqrt{3}$

D) 3

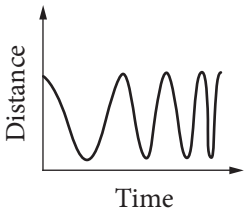
CONTINUE

21

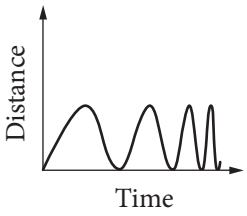


In the figure above, X is a mark on the side of a tire of a car at rest. The car, starting from rest, will experience an acceleration for some period of time. Which of the following graphs could represent the distance between the mark X and the ground after the car starts to accelerate and the tire makes its first few revolutions?

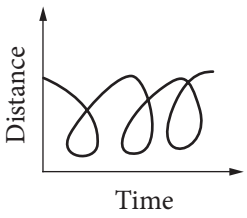
A)



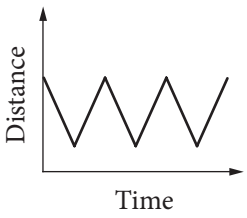
B)



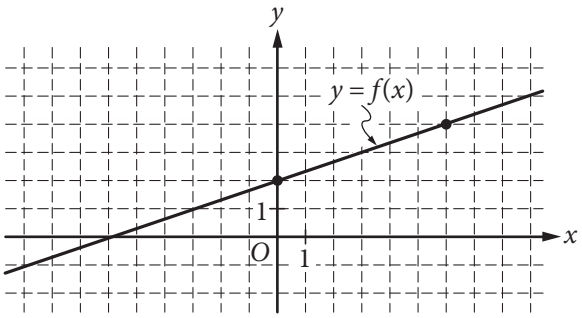
C)



D)



22



The graph of the function f is shown in the xy-plane above. The function f is defined by the equation $f(x) = \frac{a}{b}x + c$ for positive constants a, b, and c, where $\frac{a}{b}$ is a fraction in lowest terms. Which of the following orders a, b, and c from least to greatest?

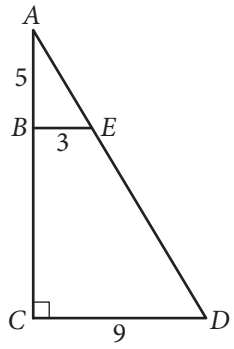
A) $a < b < c$

B) $a < c < b$

C) $b < c < a$

D) $c < a < b$

23



In the figure above, $\triangle ACD$ is a right triangle and $\overline{BE}$ is parallel to $\overline{CD}$. What is the perimeter of $\triangle ACD$ to the nearest tenth of a unit?

A) 29.7

B) 36.0

C) 41.5

D) 50.9

24

In the xy-plane, the graph of a linear equation of the form $y = mx + b$ and the graph of an exponential equation of the form $y = ab^x$ both contain points $(1, 3)$ and $(2, 4)$. If the point (r, s) is on the graph of the linear equation and the point (r, t) is on the graph of the exponential equation, where $0 < r < 4$ and $s > t$, which of the following must be true?

A) $0 < r < 1$

B) $1 < r < 2$

C) $2 < r < 3$

D) $3 < r < 4$

CONTINUE

25

Two independent surveys asked random samples of 500 people about the distances they commute to work each day. The results of the surveys are detailed in the table below.

Daily Commuting Distance

Survey	Mean (miles)	Standard deviation (miles)
A	13.9	1.5
B	15.1	1.5

Which statement is true based on the results of these surveys?

A) There is a greater variation in the distribution of the distances people commute to work in Survey A.

B) There is a greater variation in the distribution of the distances people commute to work in Survey B.

C) The variation in the distribution of the distances people commute is the same in both surveys.

D) It is impossible to determine the variation in the distribution of the distances people commute because the means are different.

26

During an ice age, the average annual global temperature was at least 4 degrees Celsius lower than the modern average. If the average annual temperature of an ice age is y degrees Celsius and the modern average annual temperature is x degrees Celsius, which of the following must be true?

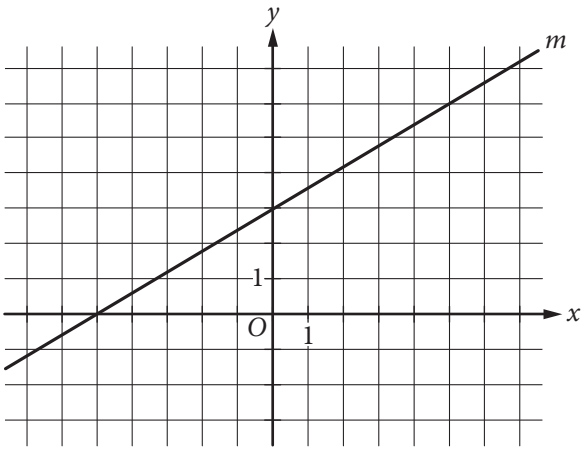
A) $y = x - 4$

B) $y \leq x + 4$

C) $y \geq x - 4$

D) $y \leq x - 4$

27



In the xy-plane above, line m is perpendicular to line ℓ (not shown). Which of the following could be an equation of line ℓ ?

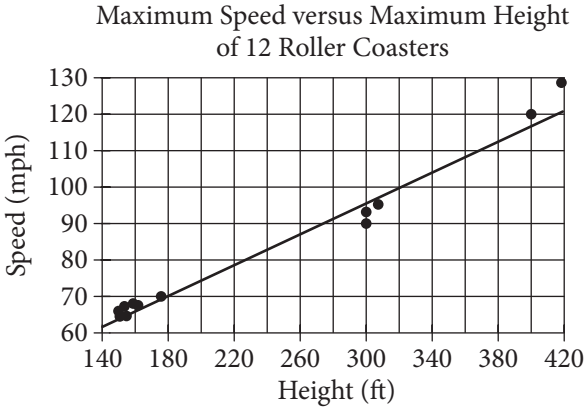
A) $5x + 3y + 3 = 0$

B) $5x - 3y + 3 = 0$

C) $3x - 5y + 15 = 0$

D) $3x + 5y - 15 = 0$

28



The scatterplot above shows the maximum height h, in feet (ft), and maximum speed s, in miles per hour (mph), of 12 roller coasters as well as the line of best fit for the data. Of the following, which best represents an equation for the line of best fit?

A) $s = 0.21h + 32$

B) $s = 0.43h + 32$

C) $s = 0.21h + 62$

D) $s = 0.43h + 62$

29

Selena created a scale model of an airplane where 1 centimeter on the model equals 6 meters on the airplane. The wingspan of the model is 10.7 centimeters. Selena wants to make a new model where a scale of 1 centimeter on the model equals 3 meters on the airplane. Which of the following best describes how the wingspan of the new model will compare to the wingspan of the first model?

A) The wingspan of the new model will be 3 centimeters shorter than the first model.

B) The wingspan of the new model will be 3 centimeters longer than the first model.

C) The wingspan of the new model will be $\frac{1}{2}$ as long as the wingspan of the first model.

D) The wingspan of the new model will be 2 times as long as the wingspan of the first model.

30

Hongbo sold x cell phones in 2013. The number of cell phones he sold in 2014 was 128% greater than in 2013, and the number of cell phones he sold in 2015 was 29% greater than in 2014. Which of the following expressions represents the number of cell phones Hongbo sold in 2015?

A) $(0.29)(1.28x)$

B) $(0.29)(2.28x)$

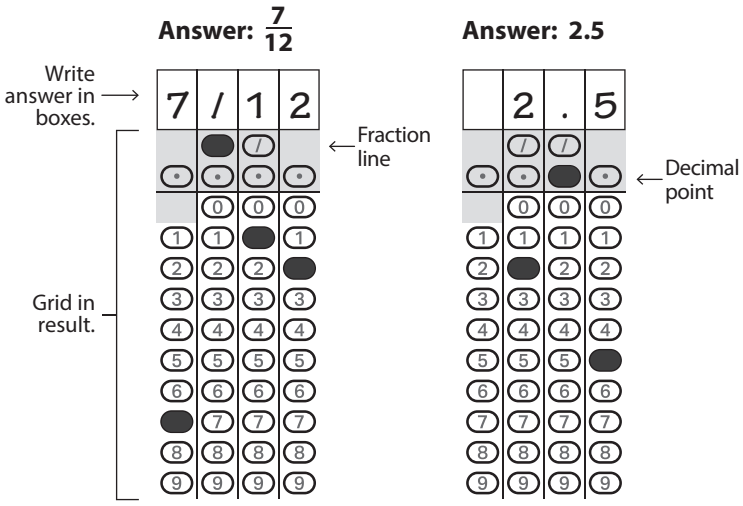
C) $(1.29)(1.28x)$

D) $(1.29)(2.28x)$

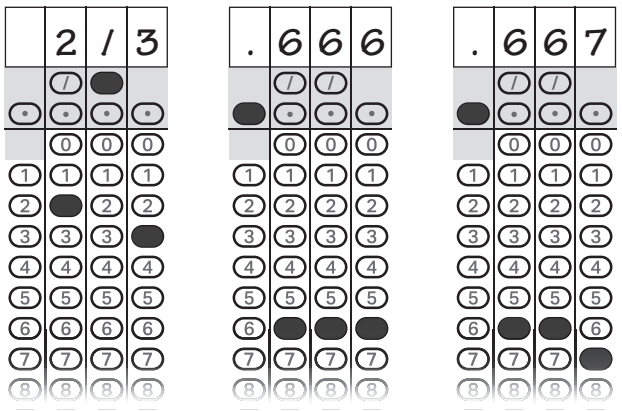
DIRECTIONS

For questions 31-38, solve the problem and enter your answer in the grid, as described below, on the answer sheet.

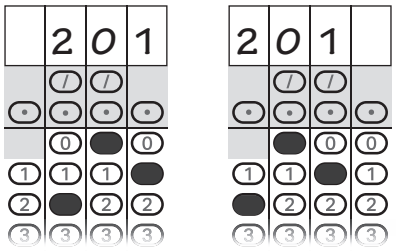
1. Although not required, it is suggested that you write your answer in the boxes at the top of the columns to help you fill in the bubbles accurately. You will receive credit only if the bubbles are filled in correctly.
2. Mark no more than one bubble in any column.
3. No question has a negative answer.
4. Some problems may have more than one correct answer. In such cases, grid only one answer.
5. **Mixed numbers** such as $3\frac{1}{2}$ must be gridded as 3.5 or 7/2. (If  is entered into the grid, it will be interpreted as $\frac{31}{2}$, not $3\frac{1}{2}$.)
6. **Decimal answers:** If you obtain a decimal answer with more digits than the grid can accommodate, it may be either rounded or truncated, but it must fill the entire grid.



Acceptable ways to grid $\frac{2}{3}$ are:



Answer: 201 – either position is correct



NOTE:
You may start your answers in any column, space permitting. Columns you don't need to use should be left blank.

31

Anna was 99 centimeters tall the day she turned 3 years old, and she was 106.5 centimeters tall the day she turned 4 years old. If Anna's height increases by the same amount each year between the ages of 2 and 8, how many centimeters tall will she be the day she turns 7 years old?

32

Cars Registered in Town X

Car color	Percent of registered cars
Black	13%
Blue	7%
Gray	7%
Silver	28%
White	32%
Other	13%

The table above shows the distribution of color for the 4000 cars registered in Town X. Based on the table, how many more white cars than black cars are registered in Town X?

33

$$3x + 2y = 16$$
$$6x + 2y = 28$$

If the system of equations above has solution (x, y), what is the value of $x + y$?

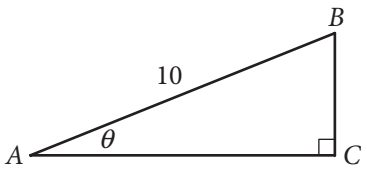
34

Monthly Enrollments in Art Classes

Community center	Jan	Feb	Mar	Apr	May	Jun	Jul
A	124	111	98	82	77	152	133
B	465	407	391	354	365	511	495

The table above shows monthly enrollments in art classes at two community centers for 7 consecutive months. Based on the table, by how much does the median monthly enrollment in community center B exceed the median monthly enrollment in community center A for the 7 months?

35



In the right triangle above, $\sin\theta = \frac{2}{5}$. If $AC = \sqrt{n}$, what is the value of n ?

36

In the xy-plane, the graph of $y = x^2 + bx + c$, where b and c are constants, has x-intercepts at $x = -2$ and $x = -6$. What is the value of b ?

CONTINUE

Questions 37 and 38 refer to the following information.

A contractor purchased two slabs of granite, both in the shape of a right rectangular prism. The table below shows some information about the two slabs.

	Length	Width	Thickness	Mass
Slab 1	100 centimeters	20 centimeters	8 centimeters	44,000 grams
Slab 2	125 centimeters		8 centimeters	

37

What is the density, in grams per cubic centimeter, of Slab 1 ?

38

Slab 2 has a ratio of length to width of 5 to 2. How many centimeters wide is Slab 2 ?

STOP

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

April 2019

The SAT®

Question-and-Answer Service Student Guide

Ideas for using the QAS report

The answer key for the test you took

Instructions for scoring your test

CollegeBoard

Answer Key – Determine Raw Scores

Reading Test Answers

Question #	Correct Answer	Question #	Correct Answer	Question #	Correct Answer	Question #	Correct Answer
1	A	14	C	27	C	40	B
2	D	15	C	28	A	41	D
3	A	16	D	29	C	42	A
4	C	17	D	30	A	43	B
5	B	18	B	31	D	44	D
6	C	19	D	32	B	45	C
7	B	20	C	33	C	46	C
8	A	21	A	34	C	47	A
9	D	22	C	35	B	48	D
10	C	23	B	36	D	49	B
11	B	24	D	37	D	50	A
12	B	25	A	38	B	51	D
13	A	26	B	39	D	52	A

Reading Test Raw Score
(Number of Correct Answers)

Writing and Language Test Answers

Question #	Correct Answer	Question #	Correct Answer	Question #	Correct Answer	Question #	Correct Answer
1	B	12	B	23	C	34	C
2	C	13	A	24	B	35	B
3	D	14	D	25	B	36	A
4	C	15	D	26	A	37	D
5	A	16	B	27	A	38	A
6	D	17	D	28	C	39	A
7	B	18	C	29	D	40	B
8	C	19	C	30	A	41	D
9	D	20	B	31	B	42	B
10	B	21	D	32	D	43	C
11	C	22	D	33	A	44	C

Writing and Language Test Raw Score
(Number of Correct Answers)

"U" indicates a question that did not perform as expected and has been removed from scoring.

On test day you may have answered questions in a different order than what you see above. Use the questions and answers online to determine specific answers.

Answer Key – Determine Raw Scores (continued)

Math Test – No Calculator Answers

Question #	Correct Answer	Question #	Correct Answer	Question #	Correct Answer	Question #	Correct Answer
1	B	5	C	9	C	13	D
2	D	6	B	10	C	14	A
3	B	7	A	11	B	15	B
4	A	8	B	12	A		

Question #	Correct Answer
16	2,4,8
17	2
18	6
19	1/2,.5
20	8

Math Test – No Calculator Raw Score
(Number of Correct Answers)

Math Test – Calculator Answers

Question #	Correct Answer	Question #	Correct Answer	Question #	Correct Answer	Question #	Correct Answer
1	A	9	C	17	C	25	C
2	C	10	C	18	B	26	D
3	A	11	B	19	B	27	A
4	D	12	B	20	A	28	A
5	B	13	B	21	A	29	D
6	B	14	C	22	B	30	D
7	A	15	A	23	C		
8	D	16	B	24	B		

Question #	Correct Answer
31	129
32	760
33	6
34	296
35	84
36	8
37	2.75,11/4
38	50

Math Test – Calculator Raw Score
(Number of Correct Answers)

On test day you may have answered questions in a different order than what you see above. Use the questions and answers online to determine specific answers.

"U" indicates a question that did not perform as expected and has been removed from scoring.

GET CROSS-TEST SCORES

The SAT also reports two cross-test scores: Analysis in History/Social Studies and Analysis in Science. These scores are based on questions in the Reading, Writing and Language, and Math Tests that ask you to think analytically about texts and questions in these subject areas.

Cross-test scores are reported on a scale of 10–40.

Calculating Your Cross-Test Scores

You can use the cross-test score tables beginning on the next page to calculate your cross-test scores as follows:

1. Find the questions in each section that count toward each cross-test score. These are shown with a "Y" next to the question number in the tables. Refer to your QAS report to see which of those questions you answered correctly on the test, and then check the box for each correct answer.
2. Count the number of correct answers for each cross-test area and record that as your raw score for that area.
3. Use the conversion table on page 12 (if you took the paper test) or page 15 (if you took the digital test) to determine your scaled score (10–40) for each area.

Cross-Test Scores Tables – Determine Cross-Test Raw Scores

Y = Counts toward Cross-Test score. On your QAS report, look up every question marked "Y" below to see if you answered it correctly. If so, check off the box for that question below.

Analysis in History/Social Studies (HSS)

Reading		Writing and Language		Math Test - Calculator		Math Test - No Calculator	
1		1	Y ☐	1		1	
2		2	Y ☐	2		2	
3		3	Y ☐	3		3	
4		4		4		4	
5		5		5		5	
6		6		6		6	
7		7	Y ☐	7	Y ☐	7	
8		8		8	Y ☐	8	
9		9	Y ☐	9		9	
10		10		10	Y ☐	10	
11	Y ☐	11	Y ☐	11	Y ☐	11	
12	Y ☐	12		12		12	
13	Y ☐	13		13		13	Y ☐
14	Y ☐	14		14		14	
15	Y ☐	15		15		15	
16	Y ☐	16		16		16	
17	Y ☐	17		17		17	
18	Y ☐	18		18		18	
19	Y ☐	19		19		19	
20	Y ☐	20		20		20	
21	Y ☐	21		21			
22		22		22			
23		23		23			
24		24		24			
25		25		25	Y ☐		
26		26		26			
27		27		27			
28		28		28			
29		29		29			
30		30		30	Y ☐		
31		31		31			
32		32		32			
33	Y ☐	33		33			
34	Y ☐	34		34	Y ☐		
35	Y ☐	35		35			
36	Y ☐	36		36			
37	Y ☐	37		37			
38	Y ☐	38		38			
39	Y ☐	39					
40	Y ☐	40					
41	Y ☐	41					
42	Y ☐	42					
43		43					
44		44					
45							
46							
47							
48							
49							
50							
51							
52							

HSS Raw Score

Analysis in Science (SCI)

Reading		Writing and Language		Math Test - Calculator		Math Test - No Calculator	
1		1		1		1	
2		2		2		2	
3		3		3		3	
4		4		4		4	
5		5		5	Y ☐	5	
6		6		6		6	
7		7		7		7	
8		8		8		8	Y ☐
9		9		9		9	
10		10		10		10	Y ☐
11		11		11		11	
12		12		12		12	
13		13		13		13	
14		14		14		14	
15		15		15		15	
16		16		16	Y ☐	16	
17		17		17		17	
18		18		18		18	
19		19		19		19	
20		20		20		20	
21		21		21	Y ☐		
22	Y ☐	22		22			
23	Y ☐	23		23			
24	Y ☐	24		24			
25	Y ☐	25		25			
26	Y ☐	26		26	Y ☐		
27	Y ☐	27	Y ☐	27			
28	Y ☐	28	Y ☐	28			
29	Y ☐	29	Y ☐	29	Y ☐		
30	Y ☐	30	Y ☐	30			
31	Y ☐	31	Y ☐	31	Y ☐		
32	Y ☐	32		32			
33		33	Y ☐	33			
34		34		34			
35		35		35			
36		36		36			
37		37		37			
38		38		38			
39		39					
40		40					
41		41					
42		42					
43	Y ☐	43					
44	Y ☐	44					
45	Y ☐						
46	Y ☐						
47	Y ☐						
48	Y ☐						
49	Y ☐						
50	Y ☐						
51	Y ☐						
52	Y ☐						

SCI Raw Score

Subscores Tables – Determine Subscore Raw Scores

Y = Counts toward subscore. On your QAS report, look up every question marked "Y" to see if you answered it correctly. If so, check off the box for that question.

Command of Evidence (COE)

	Reading		Writing and Language	
1			1	
2			2	Y ☐
3			3	
4			4	
5	Y ☐		5	
6			6	
7			7	Y ☐
8	Y ☐		8	
9			9	
10			10	
11			11	
12			12	
13			13	Y ☐
14			14	
15			15	
16			16	Y ☐
17	Y ☐		17	
18			18	
19	Y ☐		19	
20			20	
21			21	
22			22	
23			23	
24			24	
25			25	
26			26	
27			27	
28			28	
29			29	
30	Y ☐		30	Y ☐
31			31	Y ☐
32	Y ☐		32	
33			33	
34			34	Y ☐
35			35	
36			36	Y ☐
37			37	
38			38	
39			39	
40			40	
41	Y ☐		41	
42			42	
43			43	
44	Y ☐		44	
45				
46				
47	Y ☐			
48	Y ☐			
49				
50				
51				
52				

COE Raw Score

Expression of Ideas (EOI)

	Reading		Writing and Language	
1			1	Y ☐
2			2	Y ☐
3			3	Y ☐
4			4	
5			5	
6			6	
7			7	Y ☐
8			8	
9			9	Y ☐
10			10	
11			11	Y ☐
12			12	
13			13	Y ☐
14			14	Y ☐
15			15	
16			16	Y ☐
17			17	
18			18	Y ☐
19			19	Y ☐
20			20	
21			21	Y ☐
22			22	
23			23	
24			24	
25			25	
26			26	
27			27	Y ☐
28			28	Y ☐
29			29	Y ☐
30			30	Y ☐
31			31	Y ☐
32			32	
33			33	Y ☐
34			34	Y ☐
35			35	
36			36	Y ☐
37			37	
38			38	Y ☐
39			39	
40			40	
41			41	Y ☐
42			42	Y ☐
43			43	
44			44	Y ☐
45				
46				
47				
48				
49				
50				
51				
52				

EOI Raw Score

Words in Context (WIC)

	Reading		Writing and Language	
1			1	Y ☐
2			2	
3	Y ☐		3	
4			4	
5			5	
6			6	
7			7	
8			8	
9			9	Y ☐
10	Y ☐		10	
11			11	
12			12	
13	Y ☐		13	
14	Y ☐		14	
15			15	
16			16	
17			17	
18			18	Y ☐
19			19	
20			20	
21			21	Y ☐
22			22	
23			23	
24			24	
25			25	
26			26	
27			27	Y ☐
28	Y ☐		28	
29	Y ☐		29	Y ☐
30			30	
31			31	
32			32	
33			33	
34			34	
35	Y ☐		35	
36			36	
37	Y ☐		37	
38			38	
39			39	
40			40	
41			41	Y ☐
42			42	Y ☐
43			43	
44			44	
45				
46	Y ☐			
47				
48				
49	Y ☐			
50				
51				
52				

WIC Raw Score

Standard English Conventions (SEC)

	Reading		Writing and Language	
1			1	
2			2	
3			3	
4			4	Y ☐
5			5	Y ☐
6			6	Y ☐
7			7	
8			8	Y ☐
9			9	
10			10	Y ☐
11			11	
12			12	Y ☐
13			13	
14			14	
15			15	Y ☐
16			16	
17			17	Y ☐
18			18	
19			19	
20			20	Y ☐
21			21	
22			22	Y ☐
23			23	Y ☐
24			24	Y ☐
25			25	Y ☐
26			26	Y ☐
27			27	
28			28	
29			29	
30			30	
31			31	
32			32	Y ☐
33			33	
34			34	
35			35	Y ☐
36			36	
37			37	Y ☐
38			38	
39			39	Y ☐
40			40	Y ☐
41			41	
42			42	
43			43	Y ☐
44			44	
45				
46				
47				
48				
49				
50				
51				
52				

SEC Raw Score

Subscores Tables – Determine Subscore Raw Scores (continued)

Y = Counts toward Subscore. On your QAS report, look up every question marked "Y" to see if you answered it correctly. If so, check off the box for that question.

Heart of Algebra (HOA)

Math Test – Calculator		Math Test – No Calculator	
1	Y ☐	1	Y ☐
2		2	
3		3	Y ☐
4		4	Y ☐
5		5	
6		6	Y ☐
7	Y ☐	7	
8		8	
9		9	Y ☐
10	Y ☐	10	
11		11	
12	Y ☐	12	
13	Y ☐	13	Y ☐
14		14	
15	Y ☐	15	
16		16	
17		17	
18		18	Y ☐
19		19	Y ☐
20		20	
21			
22	Y ☐		
23			
24			
25			
26	Y ☐		
27	Y ☐		
28			
29			
30			
31	Y ☐		
32			
33	Y ☐		
34			
35			
36			
37			
38			

Problem Solving and Data Analysis (PSD)

Math Test – Calculator		Math Test – No Calculator	
1		1	
2		2	
3		3	
4	Y ☐	4	
5	Y ☐	5	
6		6	
7		7	
8	Y ☐	8	
9	Y ☐	9	
10		10	
11		11	
12		12	
13		13	
14	Y ☐	14	
15		15	
16		16	
17		17	
18	Y ☐	18	
19	Y ☐	19	
20		20	
21	Y ☐		
22			
23			
24	Y ☐		
25	Y ☐		
26			
27			
28	Y ☐		
29	Y ☐		
30	Y ☐		
31			
32	Y ☐		
33			
34	Y ☐		
35			
36			
37	Y ☐		
38	Y ☐		

Passport to Advanced Math (PAM)

Math Test – Calculator		Math Test – No Calculator	
1		1	
2		2	Y ☐
3	Y ☐	3	
4		4	
5		5	Y ☐
6	Y ☐	6	
7		7	Y ☐
8		8	Y ☐
9		9	
10		10	Y ☐
11	Y ☐	11	
12		12	Y ☐
13		13	
14		14	
15		15	Y ☐
16	Y ☐	16	Y ☐
17	Y ☐	17	Y ☐
18		18	
19		19	
20	Y ☐	20	
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
31			
32			
33			
34			
35			
36	Y ☐		
37			
38			

HOA Raw Score	**PSD Raw Score**	**PAM Raw Score**

CONVERSION TABLES

Raw Score Conversion – Section and Test Scores (Paper Test)

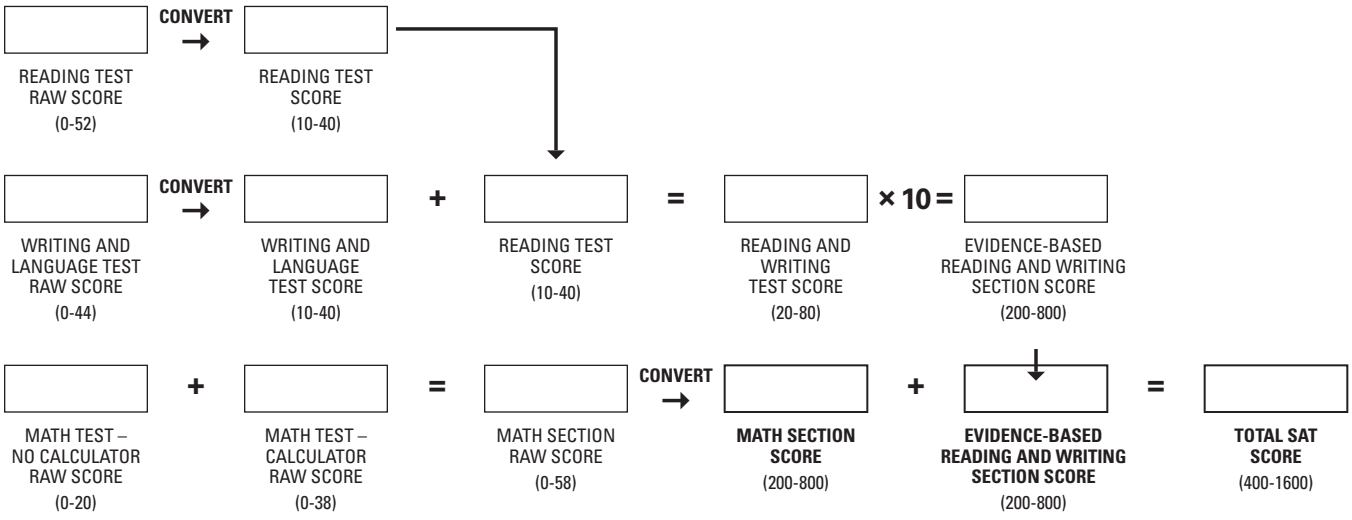
Section and Test Scores

RAW SCORE CONVERSION TABLE 1

Raw Score (# of correct answers)	Math Section Score	Reading Test Score	Writing and Language Test Score
0	200	10	10
1	200	10	10
2	210	10	10
3	220	10	11
4	240	11	11
5	250	12	12
6	260	13	13
7	280	13	14
8	290	14	15
9	300	15	15
10	310	15	16
11	330	16	16
12	340	17	17
13	350	17	17
14	360	18	18
15	370	18	18
16	390	19	19
17	400	19	19
18	410	19	20
19	420	20	20
20	430	20	21
21	450	21	21
22	460	21	22
23	470	22	22
24	480	23	23
25	490	23	23
26	500	24	24
27	510	24	24
28	510	25	25
29	520	25	26
30	530	26	26
31	530	26	27
32	540	27	28
33	550	27	28
34	550	28	29
35	560	28	29
36	570	29	30
37	580	29	31
38	590	30	31
39	590	30	32
40	600	31	33
41	610	31	34
42	620	32	36
43	630	32	38
44	640	33	40
45	650	34	
46	660	34	
47	670	35	
48	680	36	
49	690	37	
50	700	38	
51	710	39	
52	720	40	
53	740		
54	750		
55	770		
56	780		
57	790		
58	800		

Section and Test Scores

CONVERSION EQUATION 1



Raw Score Conversion – Cross-Test Scores (Paper Test)

Cross-Test Scores

RAW SCORE CONVERSION | TABLE 2

Raw Score (# of correct answers)	Analysis in History/Social Studies Cross-Test Score	Analysis in Science Cross-Test Score	Raw Score (# of correct answers)	Analysis in History/Social Studies Cross-Test Score	Analysis in Science Cross-Test Score
0	10	10	18	24	25
1	10	10	19	25	25
2	11	11	20	26	26
3	12	12	21	26	27
4	13	13	22	27	28
5	14	14	23	28	28
6	15	15	24	28	29
7	16	16	25	29	30
8	17	17	26	30	31
9	18	18	27	31	31
10	19	18	28	32	32
11	19	19	29	33	33
12	20	20	30	34	33
13	21	21	31	35	34
14	22	22	32	36	35
15	22	22	33	37	36
16	23	23	34	39	38
17	24	24	35	40	40

Cross-Test Scores

CONVERSION EQUATION 2

ANALYSIS IN HISTORY/ SOCIAL STUDIES RAW SCORE (0-35)

ANALYSIS IN HISTORY/ SOCIAL STUDIES SUBSCORE (10-40)

ANALYSIS IN SCIENCE RAW SCORE (0-35)

ANALYSIS IN SCIENCE SUBSCORE (10-40)

Raw Score Conversion – Subscores (Paper Test)

Subscores

RAW SCORE CONVERSION TABLE 3

Raw Score (# of correct answers)	Expression of Ideas	Standard English Conventions	Heart of Algebra	Problem Solving and Data Analysis	Passport to Advanced Math	Words in Context	Command of Evidence
0	1	1	1	1	1	1	1
1	1	1	1	1	2	1	2
2	2	1	2	1	3	1	3
3	2	2	3	3	5	1	4
4	3	2	4	4	6	2	4
5	4	3	4	5	7	3	5
6	4	4	5	7	7	3	6
7	4	4	6	8	8	4	6
8	5	5	6	9	9	5	7
9	5	5	7	9	9	5	7
10	6	6	8	10	10	6	8
11	6	6	8	11	11	7	8
12	7	7	9	12	11	8	9
13	7	8	9	12	12	9	10
14	8	9	10	13	13	10	11
15	8	9	10	14	14	11	11
16	9	10	11	15	15	12	12
17	9	11	12	15		13	14
18	10	12	13			15	15
19	10	13	15				
20	11	15					
21	12						
22	12						
23	13						
24	15						

Subscores

CONVERSION EQUATION 3

[ ] **CONVERT** → [ ]

COMMAND OF EVIDENCE RAW SCORE (0-18) → **COMMAND OF EVIDENCE SUBSCORE** (1-15)

WORDS IN CONTEXT RAW SCORE (0-18) → **WORDS IN CONTEXT SUBSCORE** (1-15)

EXPRESSION OF IDEAS RAW SCORE (0-24) → **EXPRESSION OF IDEAS SUBSCORE** (1-15)

STANDARD ENGLISH CONVENTIONS RAW SCORE (0-20) → **STANDARD ENGLISH CONVENTIONS SUBSCORE** (1-15)

HEART OF ALGEBRA RAW SCORE (0-19) → **HEART OF ALGEBRA SUBSCORE** (1-15)

PROBLEM SOLVING AND DATA ANALYSIS RAW SCORE (0-17) → **PROBLEM SOLVING AND DATA ANALYSIS SUBSCORE** (1-15)

PASSPORT TO ADVANCED MATH RAW SCORE (0-16) → **PASSPORT TO ADVANCED MATH SUBSCORE** (1-15)

Raw Score Conversion – Section and Test Scores (Digital Test)

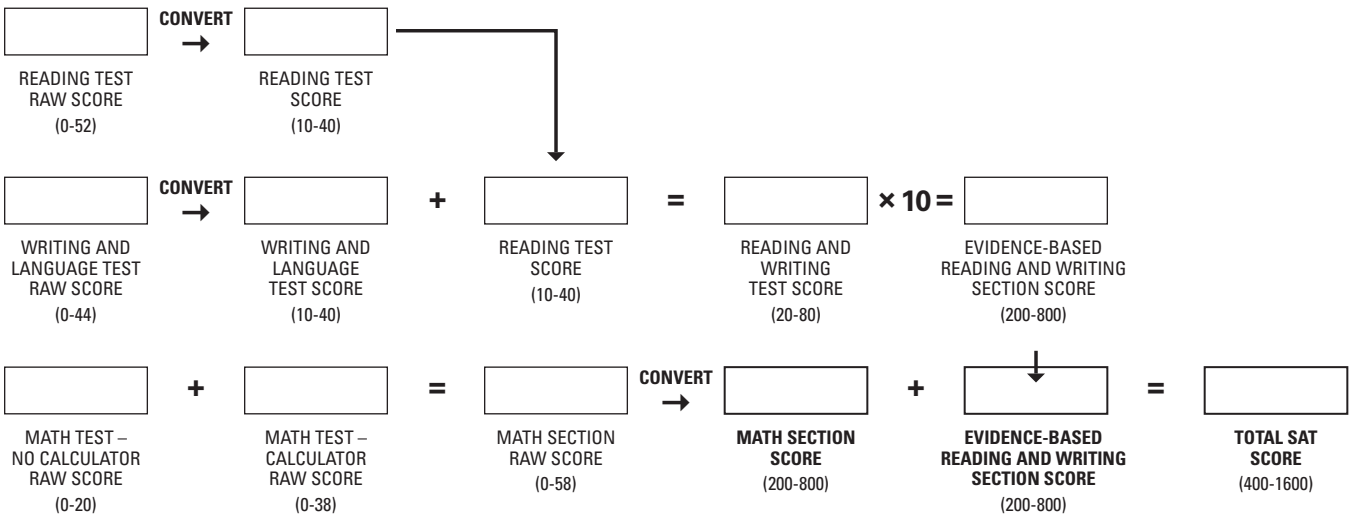
Section and Test Scores

RAW SCORE CONVERSION TABLE 1

Raw Score (# of correct answers)	Math Section Score	Reading Test Score	Writing and Language Test Score
0	200	10	10
1	200	10	10
2	210	10	10
3	220	10	11
4	240	11	11
5	250	12	12
6	260	13	13
7	280	14	14
8	290	15	15
9	300	15	15
10	310	16	16
11	330	16	16
12	340	17	17
13	350	17	17
14	360	17	18
15	370	18	18
16	390	18	19
17	400	18	19
18	410	19	20
19	420	19	20
20	430	20	21
21	450	20	21
22	460	20	22
23	470	21	22
24	480	22	23
25	490	22	23
26	500	23	24
27	510	23	24
28	510	24	25
29	520	24	26
30	530	25	26
31	530	25	27
32	540	26	28
33	550	26	28
34	550	27	29
35	560	27	29
36	570	28	30
37	580	28	31
38	590	29	31
39	590	30	32
40	600	30	33
41	610	31	34
42	620	31	36
43	630	32	38
44	640	32	40
45	650	33	
46	660	34	
47	670	35	
48	680	36	
49	690	37	
50	700	37	
51	710	39	
52	720	40	
53	740		
54	750		
55	770		
56	780		
57	790		
58	800		

Section and Test Scores

CONVERSION EQUATION 1



Raw Score Conversion – Cross-Test Scores (Digital Test)

Cross-Test Scores

RAW SCORE CONVERSION | TABLE 2

Raw Score (# of correct answers)	Expression of Ideas	Standard English Conventions	Heart of Algebra	Problem Solving and Data Analysis	Passport to Advanced Math	Words in Context	Command of Evidence
0	1	1	1	1	1	1	1
1	1	1	1	1	2	1	2
2	2	1	2	1	3	1	3
3	2	2	3	3	5	1	4
4	3	2	4	4	6	2	4
5	4	3	4	5	7	3	5
6	4	4	5	7	7	3	5
7	4	4	6	8	8	4	6
8	5	5	6	9	9	5	6
9	5	5	7	9	9	5	7
10	6	6	8	10	10	6	7
11	6	6	8	11	11	7	8
12	7	7	9	12	11	8	9
13	7	8	9	12	12	9	9
14	8	9	10	13	13	10	10
15	8	9	10	14	14	11	11
16	9	10	11	15	15	12	12
17	9	11	12	15		13	13
18	10	12	13			15	15
19	10	13	15				
20	11	15					
21	12						
22	12						
23	13						
24	15						

Cross-Test Scores

CONVERSION EQUATION 2

Raw Score Conversion – Subscores (Digital Test)

Subscores

RAW SCORE CONVERSION TABLE 3

Raw Score (# of correct answers)	Analysis in History/Social Studies Cross-Test Score	Analysis in Science Cross-Test Score
0	10	10
1	11	11
2	12	12
3	12	13
4	13	14
5	14	15
6	15	16
7	16	16
8	17	17
9	17	17
10	18	18
11	19	19
12	19	19
13	20	20
14	21	21
15	21	22
16	22	23
17	23	23

Raw Score (# of correct answers)	Analysis in History/Social Studies Cross-Test Score	Analysis in Science Cross-Test Score
18	23	24
19	24	25
20	25	26
21	26	26
22	26	27
23	27	28
24	28	29
25	29	29
26	29	30
27	30	31
28	31	32
29	32	32
30	33	33
31	34	34
32	35	34
33	37	36
34	38	37
35	40	40

Subscores

CONVERSION EQUATION 3

COMMAND OF EVIDENCE RAW SCORE (0-18)	CONVERT →	**COMMAND OF EVIDENCE SUBSCORE** (1-15)	WORDS IN CONTEXT RAW SCORE (0-18)	CONVERT →	**WORDS IN CONTEXT SUBSCORE** (1-15)
EXPRESSION OF IDEAS RAW SCORE (0-24)	CONVERT →	**EXPRESSION OF IDEAS SUBSCORE** (1-15)			
STANDARD ENGLISH CONVENTIONS RAW SCORE (0-20)	CONVERT →	**STANDARD ENGLISH CONVENTIONS SUBSCORE** (1-15)	HEART OF ALGEBRA RAW SCORE (0-19)	CONVERT →	**HEART OF ALGEBRA SUBSCORE** (1-15)
PROBLEM SOLVING AND DATA ANALYSIS RAW SCORE (0-17)	CONVERT →	**PROBLEM SOLVING AND DATA ANALYSIS SUBSCORE** (1-15)			
PASSPORT TO ADVANCED MATH RAW SCORE (0-16)	CONVERT →	**PASSPORT TO ADVANCED MATH SUBSCORE** (1-15)			