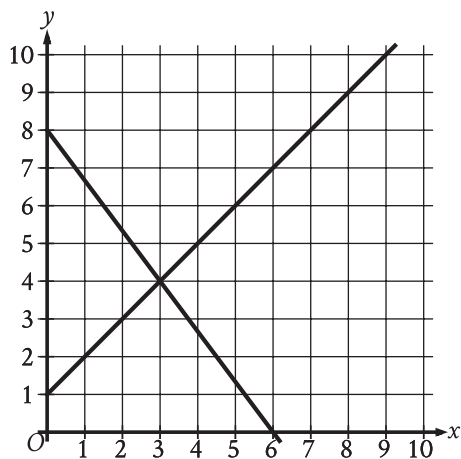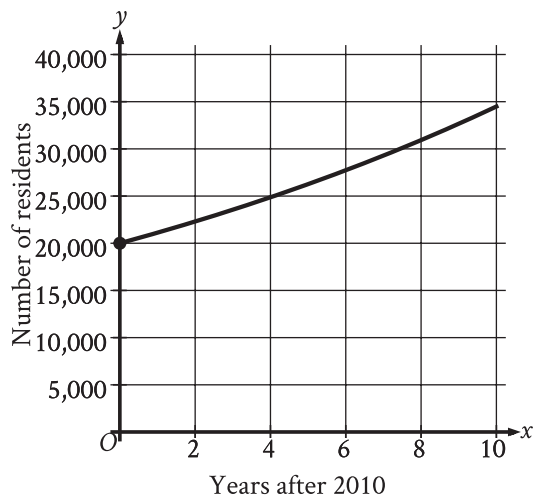1

The graph of a system of linear equations is shown. What is the solution (x, y) to the system?

A) $(2, 3)$

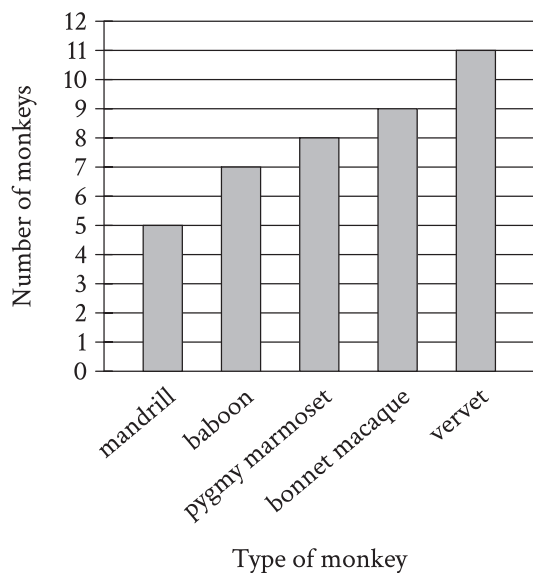B) $(3, 4)$

C) $(4, 5)$

D) $(5, 6)$

2

Years after 2010

The graph shown models the number of residents of a certain city x years after 2010. How many residents does this model estimate the city had in 2010?

A) 0

B) 2,000

C) 20,000

D) 25,000

CONTINUE

3

The bar graph shows the number of each type of monkey in a sanctuary.

Type of monkey

How many more vervets are in this sanctuary than mandrills?

A) 11

B) 6

C) 5

D) 3

4

$$3x + 5(x + 4) = 76$$

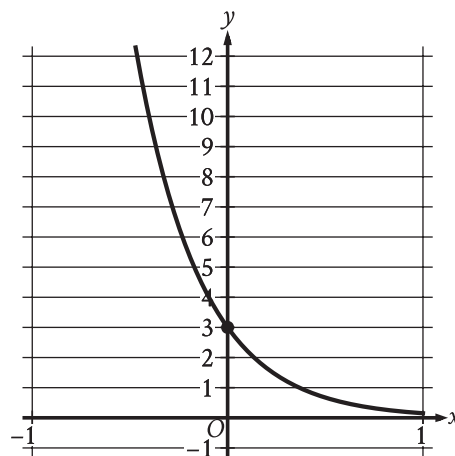What value of x is the solution to the given equation?

A) 7

B) 8

C) 56

D) 72

5

The function f is defined by $f(x) = \dfrac{16}{x}$. What is the value of $f(x)$ when $x = 17$?

A) $\dfrac{16}{17}$

B) $\dfrac{17}{16}$

C) 16

D) 17

6

The graph of the exponential function f is shown, where $y = f(x)$. The y-intercept of the graph is $(0, y)$. What is the value of y ?

CONTINUE

7

For a party, 50 dinner rolls are needed. Dinner rolls are sold in packages of 12. What is the minimum number of packages that should be bought for the party?

8

21 is 21% of what number?

A) 0

B) 1

C) 42

D) 100

9

To repair a refrigerator, a technician charges $60 per hour for labor plus $120 for parts. Which function f represents the total amount, in dollars, the technician will charge for this job if it takes x hours?

A) $f(x) = x + 120$

B) $f(x) = 60x$

C) $f(x) = 60x + 120$

D) $f(x) = 60x - 120$

10

The function f is defined by $f(x) = 80 - 6x$. What is the value of $f(7)$?
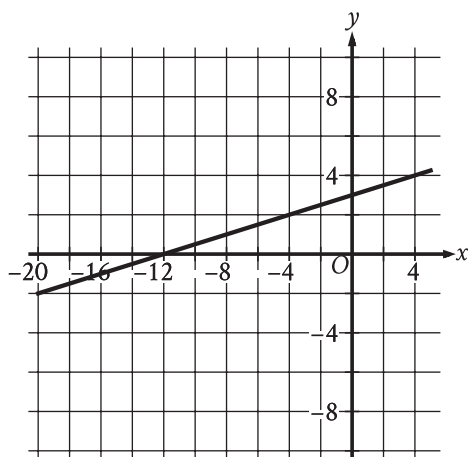
A) 13

B) 38

C) 74

D) 81

11

Naomi bought both rabbit snails and nerite snails for a total of $52. Each rabbit snail costs $8 and each nerite snail costs $6. If Naomi bought 2 nerite snails, how many rabbit snails did she buy?

A) 5

B) 12

C) 14

D) 50

CONTINUE

12

The graph of the linear function f is shown, where $y = f(x)$. What is the x-intercept of the graph of f?

A) $(-12, 0)$

B) $(0, 0)$

C) $\left(\dfrac{1}{4}, 0\right)$

D) $(12, 0)$

13

A triangle has a base length of 40 centimeters and a height of 90 centimeters. What is the area, in square centimeters, of the triangle?

14

A participant in a bicycle race completes the race with an average speed of 24,816 yards per hour. What is this average speed, in <u>miles</u> per hour? (1 mile = 1,760 yards)

15

Hydrogen is placed inside a container and kept at a constant pressure. The graph shows the estimated volume y, in liters, of the hydrogen when its temperature is x kelvins.
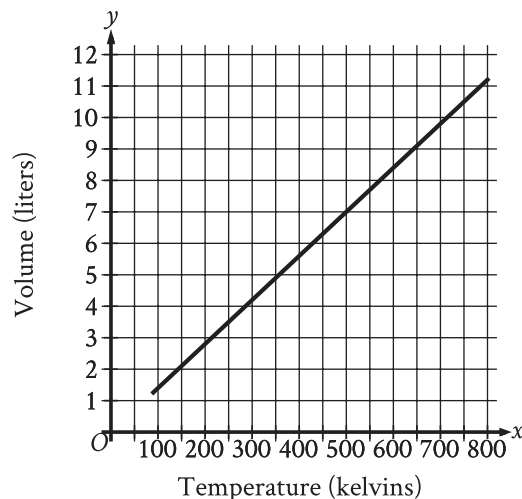
What is the estimated volume, in liters, of the hydrogen when its temperature is 500 kelvins?
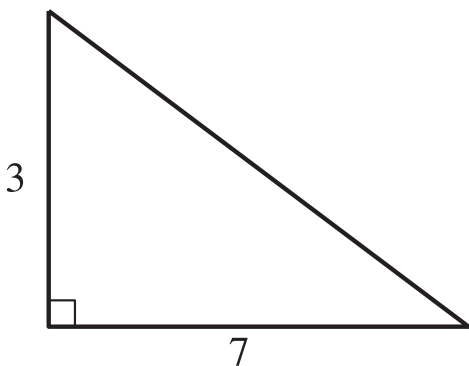
A) 0

B) $\dfrac{7}{500}$

C) 7

D) $\dfrac{500}{7}$

CONTINUE

16

$$p + 34 = q + r$$

The given equation relates the variables p, q, and r. Which equation correctly expresses p in terms of q and r ?

A) $p = q + r + 34$

B) $p = q + r - 34$

C) $p = -q - r + 34$

D) $p = -q - r - 34$

17

Note: Figure not drawn to scale.

The lengths of the legs of a right triangle are shown. Which of the following is closest to the length of the triangle's hypotenuse?

A) 3.2

B) 5

C) 7.6

D) 20

18

The number of coins in a collection increased from 9 to 90. What was the percent increase in the number of coins in this collection?

A) 10%

B) 81%

C) 90%

D) 900%

19

$$2x + y = 37$$

In triangle QRS, sides QR and RS each have a length of x centimeters and side SQ has a length of y centimeters. The given equation represents this situation. Which of the following is the best interpretation of 37 in this context?

A) The difference, in centimeters, between the lengths of sides QR and SQ

B) The difference, in centimeters, between the lengths of sides QR and RS

C) The sum of the lengths, in centimeters, of the three sides of the triangle

D) The length, in centimeters, of one of the two sides of equal length

CONTINUE

20

What is the slope of the graph of $y = \dfrac{5x}{13} - 23$ in the

xy-plane?

21

To study fluctuations in composition, samples of pumice were taken from 29 locations and cut in the shape of a cube. The length of the edge of one of these cubes is 3.000 centimeters. This cube has a density of 0.230 grams per cubic centimeter. What is the mass of this cube, in grams?

22

In the given scatterplot, a line of best fit for the data is shown.
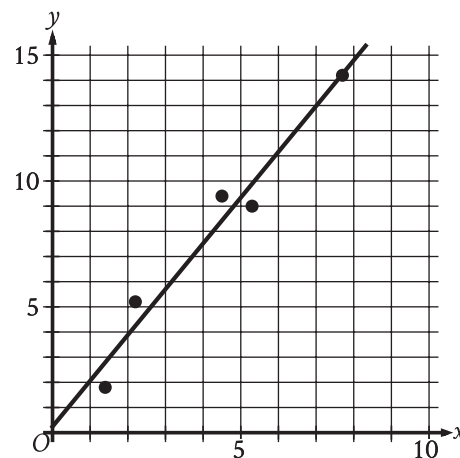
Which of the following is closest to the slope of the line of best fit shown?

A) 0.2

B) 0.7

C) 1.8

D) 2.6

33

CONTINUE

23

The length of a rectangle is 50 inches and the width is x inches. The perimeter is at most 210 inches. Which inequality represents this situation?

A) $2x + 100 \leq 210$

B) $2x + 100 \geq 210$

C) $2x + 50 \leq 210$

D) $2x + 50 \geq 210$

24

Which of the following expressions is equivalent to $8x^{10} - 8x^9 + 88x$?

A) $x(7x^{10} - 7x^9 + 87x)$

B) $x(8^{10} - 8^9 + 88)$

C) $8x(x^{10} - x^9 + 11x)$

D) $8x(x^9 - x^8 + 11)$

25

$$\frac{3}{5}x + \frac{3}{4}y = 7$$

Which table gives three values of x and their corresponding values of y for the given equation?

A)

x	y
1	$\dfrac{113}{20}$
2	$\dfrac{101}{20}$
4	$\dfrac{77}{20}$

B)

x	y
1	$\dfrac{47}{5}$
2	$\dfrac{44}{5}$
4	$\dfrac{38}{5}$

C)

x	y
1	$\dfrac{148}{15}$
2	$\dfrac{136}{15}$
4	$\dfrac{112}{15}$

D)

x	y
1	$\dfrac{128}{15}$
2	$\dfrac{116}{15}$
4	$\dfrac{92}{15}$

CONTINUE

26
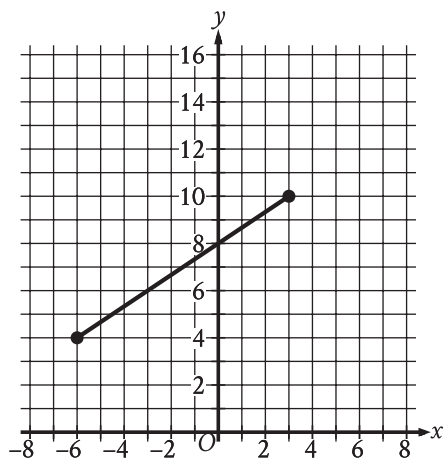
The line segment shown in the xy-plane represents one of the legs of a right triangle. The area of this triangle is $36\sqrt{13}$ square units. What is the length, in units, of the other leg of this triangle?

A) 12

B) 24

C) $3\sqrt{13}$

D) $18\sqrt{13}$

27

The solutions to $x^2 + 6x + 7 = 0$ are r and s, where $r < s$. The solutions to $x^2 + 8x + 8 = 0$ are t and u, where $t < u$. The solutions to $x^2 + 14x + c = 0$, where c is a constant, are $r + t$ and $s + u$. What is the value of c ?

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.

Math

27 QUESTIONS

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
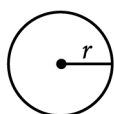
$A = \pi r^2$
$C = 2\pi r$
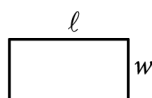
$A = \ell w$
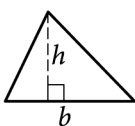
$A = \dfrac{1}{2}bh$
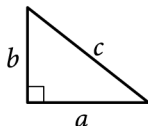
$c^2 = a^2 + b^2$
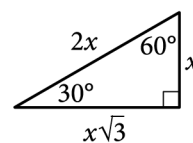
Special Right Triangles
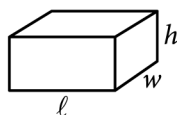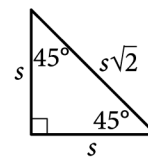
$V = \ell wh$
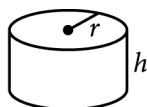
$V = \pi r^2 h$

$V = \dfrac{4}{3}\pi r^3$
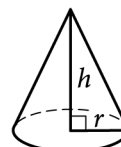
$V = \dfrac{1}{3}\pi r^2 h$

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

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

1

The scatterplot shows the relationship between the weight, in pounds, of each of 9 female gray wolves on April 30 and the number of offspring each gray wolf produced.
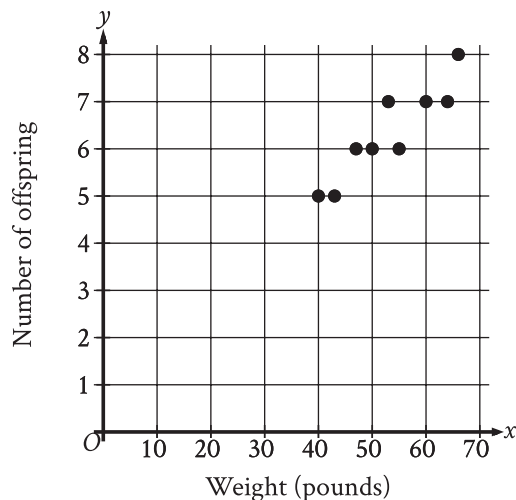
How many offspring did the 50-pound gray wolf produce?

A) 8

B) 7

C) 6

D) 5

2

$$y = 4$$
$$x = y + 6$$

The solution to the given system of equations is (x, y). What is the value of x ?

A) 10

B) 6

C) 4

D) 2

3
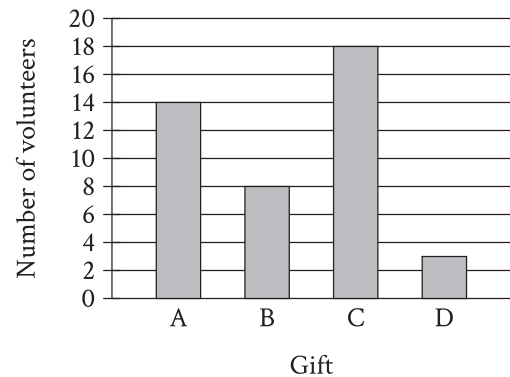
In April, there were 43 volunteers in a cleanup project. Each volunteer was asked to choose a small gift labeled A, B, C, or D. The bar graph shows the number of volunteers who chose each gift. How many volunteers chose gift C?

A) 3

B) 8

C) 14

D) 18

4

$$-13, 4, 23$$

A data set of three numbers is shown. If a number from this data set is selected at random, what is the probability of selecting a negative number?

A) 0

B) $\dfrac{1}{3}$

C) $\dfrac{2}{3}$

D) 1

CONTINUE

5

A line in the xy-plane has a slope of $-\frac{1}{2}$ and passes through the point $(0, 3)$. Which equation represents this line?

A) $y = -\frac{1}{2}x - 3$

B) $y = -\frac{1}{2}x + 3$

C) $y = \frac{1}{2}x - 3$

D) $y = \frac{1}{2}x + 3$

6

A product costs 11.00 dollars per pound. What is the cost, in dollars, for 6 pounds of the product?

7

The equation $46 = 2x + 2y$ gives the perimeter of a rectangular rug that has length x, in feet, and width y, in feet. The width of the rug is 8 feet. What is the length, in feet, of the rug?

8
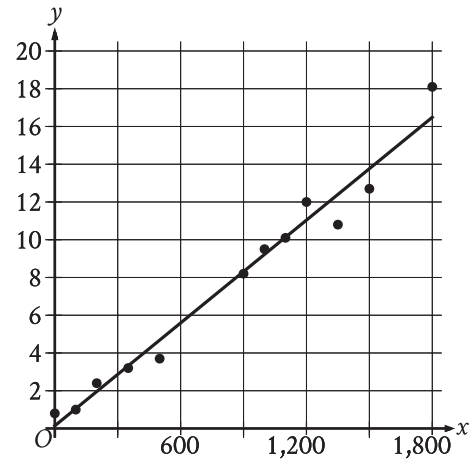
Twelve data points are shown in the scatterplot. A line of best fit for the data is also shown. At $x = 1,200$, which of the following is closest to the y-value predicted by the line of best fit?

A) 16

B) 14

C) 11

D) 6

9

Which expression is equivalent to $(8yz)(y)(7z)$?

A) $56y^2z^2$

B) $56y^2z$

C) $56yz$

D) $16yz$

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39

CONTINUE

10

A food truck buys forks for $0.04 each and plates for $0.48 each. The total cost of x forks and y plates is $661.76. Which equation represents this situation?

A) $0.48x - 0.04y = 661.76$

B) $0.04x - 0.48y = 661.76$

C) $0.48x + 0.04y = 661.76$

D) $0.04x + 0.48y = 661.76$

11
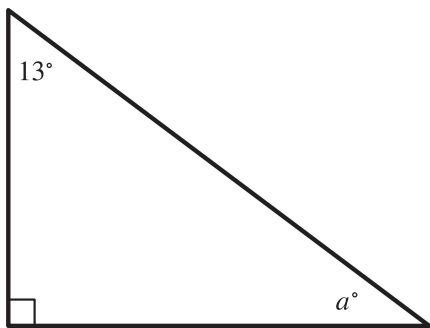
Note: Figure not drawn to scale.

In the right triangle shown, what is the value of a ?

A) 13

B) 77

C) 90

D) 103

12

Gabriella deposits $35 in a savings account at the end of each week. At the beginning of the 1st week of a year there was $600 in that savings account. How much money, in dollars, will be in the account at the end of the 4th week of that year?

A) 460

B) 635

C) 639

D) 740

13

$$x^2 = (22)(22)$$

What is the positive solution to the given equation?

14

The ratio 140 to m is equivalent to the ratio 4 to 28. What is the value of m ?

15

If $3x - 27 = 24$, what is the value of $x - 9$?

A) 1

B) 8

C) 24

D) 35

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40

CONTINUE

16

For the linear function f, $f(0) = 17$ and $f(1) = 17$. Which equation defines f ?

A) $f(x) = \dfrac{1}{17}$

B) $f(x) = 1$

C) $f(x) = 17$

D) $f(x) = 34$

17

The function $f(x) = 55.20 - 0.16x$ gives the estimated surface water temperature $f(x)$, in degrees Celsius, of a body of water on the xth day of the year, where $220 \leq x \leq 360$. Based on the model, what is the estimated surface water temperature, in degrees Celsius, of this body of water on the 326th day of the year?

A) 55.20

B) 3.04

C) −0.16

D) −52.16

18

$$y = -\dfrac{1}{5}x$$

$$y = \dfrac{1}{7}x$$

The solution to the given system of equations is (x, y). What is the value of x ?

A) −5

B) 0

C) 2

D) 7

19

A sample of a certain isotope takes 29 years to decay to half its original mass. The function

$s(t) = 184(0.5)^{\frac{t}{29}}$ gives the approximate mass of this

isotope, in grams, that remains t years after a

184-gram sample starts to decay. Which statement is

the best interpretation of $s(87) = 23$ in this context?

A) Approximately 23 grams of the sample remains 87 years after the sample starts to decay.

B) The mass of the sample has decreased by approximately 23 grams 87 years after the sample starts to decay.

C) The mass of the sample has decreased by approximately 87 grams 23 years after the sample starts to decay.

D) Approximately 87 grams of the sample remains 23 years after the sample starts to decay.

CONTINUE

20

How many <u>fluid ounces</u> are equivalent to 76 quarts? (8 fluid ounces = 1 cup and 4 cups = 1 quart)

21

A piece of wire with a length of 32 inches is cut into two parts. One part has a length of x inches, and the other part has a length of y inches. The value of x is 4 more than 3 times the value of y. What is the value of x ?

22

The table gives the perimeters of similar triangles TUV and XYZ, where $\overline{TU}$ corresponds to $\overline{XY}$. The length of $\overline{TU}$ is 18.

	Perimeter
Triangle TUV	37
Triangle XYZ	333

What is the length of $\overline{XY}$?

A) 2

B) 18

C) 55

D) 162

23

A sphere has a radius of $\dfrac{17}{5}$ feet. What is the volume, in cubic feet, of the sphere?

A) $\dfrac{5\pi}{17}$

B) $\dfrac{68\pi}{15}$

C) $\dfrac{32\pi}{5}$

D) $\dfrac{19{,}652\pi}{375}$

24
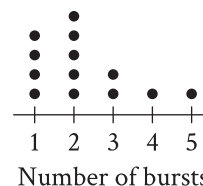
Number of bursts

The dot plot represents a data set of the number of bursts for 13 eruptions of a steam vent. If an additional eruption with 11 bursts is added to this data set to create a new data set of 14 eruptions, which of the following measures will be greater for the new data set than for the original data set?

    I. The median number of bursts

    II. The mean number of bursts

A) I and II

B) I only

C) II only

D) Neither I nor II

CONTINUE

25

A factory makes 9-inch, 7-inch, and 4-inch concrete screws. During a certain day, the number of 9-inch concrete screws that the factory makes is 5 times the number n of 7-inch concrete screws, and the number of 4-inch concrete screws is 22. During this day, the factory makes 100 concrete screws total. Which equation represents this situation?

A) $9(5n) + 7n + 4(22) = 100$

B) $9n + 7n + 4n = 100$

C) $5n + 22 = 100$

D) $6n + 22 = 100$

26

The number a is 190% greater than the number b. The number b is 80% less than 24. What is the value of a ?

A) 9.12

B) 13.92

C) 26.40

D) 36.48

27

A right square prism has a height of 14 units. The volume of the prism is 2,016 cubic units. What is the length, in units, of an edge of the base?

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.

PSAT 8/9 Practice Test Worksheet: Answer Key

Mark each of your correct answers below, then add them up to get your raw score on each module.

Reading and Writing

Module 1

QUESTION #	CORRECT	MARK YOUR CORRECT ANSWERS
1	A	
2	A	
3	C	
4	C	
5	D	
6	B	
7	C	
8	A	
9	C	
10	D	
11	B	
12	B	
13	D	
14	A	
15	D	
16	C	
17	C	
18	A	
19	C	
20	D	
21	C	
22	D	
23	A	
24	D	
25	C	
26	B	
27	B	
28	A	
29	D	
30	A	
31	A	
32	A	
33	B	

Module 2

QUESTION #	CORRECT	MARK YOUR CORRECT ANSWERS
1	A	
2	A	
3	D	
4	D	
5	A	
6	C	
7	A	
8	D	
9	B	
10	B	
11	A	
12	C	
13	A	
14	B	
15	C	
16	B	
17	B	
18	B	
19	A	
20	B	
21	A	
22	B	
23	D	
24	C	
25	C	
26	A	
27	D	
28	D	
29	D	
30	D	
31	D	
32	A	
33	D	

Math

Module 1

QUESTION #	CORRECT	MARK YOUR CORRECT ANSWERS
1	B	
2	C	
3	B	
4	A	
5	A	
6	3	
7	5	
8	D	
9	C	
10	B	
11	A	
12	A	
13	1800	
14	14.1	
15	C	
16	B	
17	C	
18	D	
19	C	
20	.3846; 5/13	
21	6.21	
22	C	
23	A	
24	D	
25	D	
26	B	
27	31	

Module 2

QUESTION #	CORRECT	MARK YOUR CORRECT ANSWERS
1	C	
2	A	
3	D	
4	B	
5	B	
6	66	
7	15	
8	C	
9	A	
10	D	
11	B	
12	D	
13	22	
14	980	
15	B	
16	C	
17	B	
18	B	
19	A	
20	2432	
21	25	
22	D	
23	D	
24	C	
25	D	
26	B	
27	12	

READING AND WRITING SECTION RAW SCORE
(Total # of Correct Answers)

Module 1 Module 2

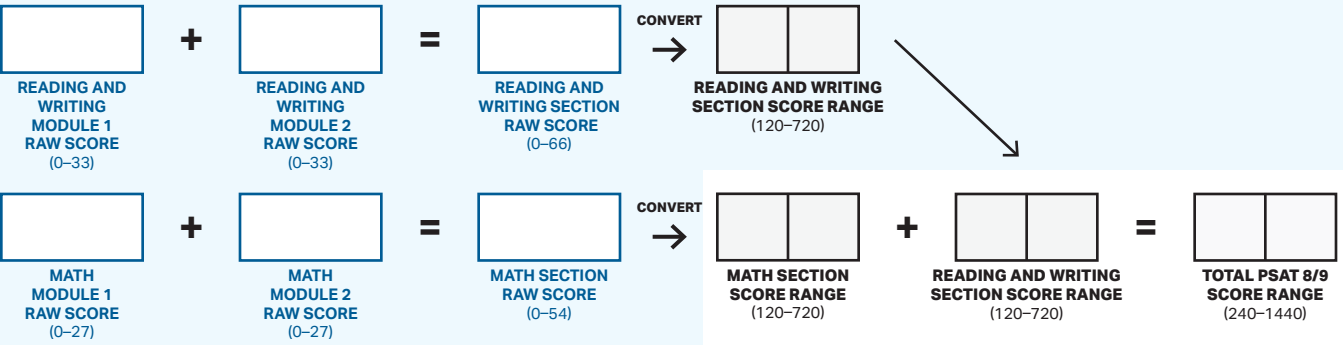**MATH SECTION RAW SCORE**
(Total # of Correct Answers)

Module 1 Module 2

PSAT 8/9 Practice Test Worksheet: Section and Total Scores

Conversion: Calculate Your Section and Total Scores

Enter the number of correct answers (raw scores from the previous page) for each of the modules in the boxes below and add them together to get your section raw score. Find that section raw score in the first column of the table below and then enter the corresponding lower and upper values in the two-column boxes. Add each of your lower and upper values for the test sections separately to calculate your total PSAT 8/9 score range.

+ **=** CONVERT →

READING AND WRITING MODULE 1 RAW SCORE (0–33)

READING AND WRITING MODULE 2 RAW SCORE (0–33)

READING AND WRITING SECTION RAW SCORE (0–66)

READING AND WRITING SECTION SCORE RANGE (120–720)

+ **=** CONVERT → **+** **=**

MATH MODULE 1 RAW SCORE (0–27)

MATH MODULE 2 RAW SCORE (0–27)

MATH SECTION RAW SCORE (0–54)

MATH SECTION SCORE RANGE (120–720)

READING AND WRITING SECTION SCORE RANGE (120–720)

TOTAL PSAT 8/9 SCORE RANGE (240–1440)

Raw Score Conversion Table: Section Scores

RAW SCORE	Reading and Writing Section Score Range		Math Section Score Range		RAW SCORE	Reading and Writing Section Score Range		Math Section Score Range	
(# OF CORRECT ANSWERS)	LOWER	UPPER	LOWER	UPPER	(# OF CORRECT ANSWERS)	LOWER	UPPER	LOWER	UPPER
0	120	120	120	120	34	360	400	430	470
1	120	140	120	140	35	360	400	440	480
2	120	150	120	150	36	370	410	450	490
3	130	160	130	160	37	380	420	460	500
4	130	170	140	170	38	380	420	470	510
5	130	180	150	190	39	390	430	480	520
6	130	190	160	230	40	390	430	490	530
7	130	190	170	250	41	400	440	500	560
8	130	200	180	250	42	410	450	510	570
9	140	200	200	270	43	410	450	520	580
10	150	210	220	300	44	420	460	530	590
11	160	220	260	320	45	430	470	550	610
12	170	230	280	320	46	440	480	560	620
13	170	230	290	330	47	450	490	580	640
14	180	240	300	340	48	450	490	600	660
15	190	250	310	350	49	460	500	610	690
16	190	290	320	360	50	470	510	630	710
17	200	300	320	360	51	470	530	650	710
18	230	310	330	370	52	480	540	670	720
19	260	320	340	380	53	490	550	680	720
20	270	330	340	380	54	500	560	720	720
21	290	330	350	390	55	510	570		
22	290	330	350	390	56	520	580		
23	300	340	360	400	57	540	600		
24	310	350	370	410	58	550	610		
25	310	350	370	410	59	570	630		
26	320	360	380	420	60	580	660		
27	320	360	380	420	61	600	680		
28	330	370	390	430	62	620	700		
29	330	370	390	430	63	640	710		
30	340	380	400	440	64	670	710		
31	340	380	410	450	65	680	720		
32	350	390	410	450	66	720	720		
33	350	390	420	460					