4   🖩   **4**

Math Test – Calculator

55 MINUTES, 38 QUESTIONS

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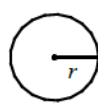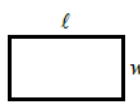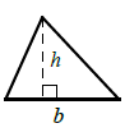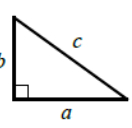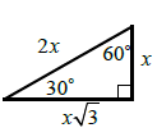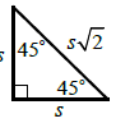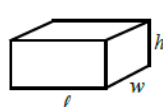

DIRECTIONS

For questions **1-30**, solve each problem, choose the best answer from the choices provided, and fill in the corresponding circle 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 14 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 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

$A = \pi r^2$ $A = \ell w$ $A = \frac{1}{2}bh$ $c^2 = a^2 + b^2$ Special Right Triangles

$C = 2\pi r$

$V = \ell w h$ $V = \pi r^2 h$ $V = \frac{4}{3}\pi r^3$ $V = \frac{1}{3}\pi r^2 h$ $V = \frac{1}{3}\ell w h$

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

1

Half the difference of 18 and a number n is equal to the sum of n and three. What is the value of n?

A) $\dfrac{5}{2}$

B) 4

C) $\dfrac{11}{2}$

D) 6

2

If $0.14x = 2.8$, what is the value of $\dfrac{1}{x}$?

A) 0.2

B) 0.5

C) 0.02

D) 0.05

3

$$11 + 5x = kx - 3(x - 4)$$

If the linear equation above has no solution, which of the following could be the value of k?

A) −1

B) 2

C) 5

D) 8

4

If $f(2 - x) = 3x - 5$ for all values of x, what is the value of $f(-3)$?

A) −14

B) −2

C) 10

D) 14

SAT Multiple Choice

5

The line of a graph in the xy-plane has slope $\frac{1}{3}$ and contains the point $(6,-1)$. The graph of a second line passes through the points $(0,1)$ and $(1,0)$. If the two lines intersect at the point (p,q), what is the value of $p \cdot q$?

A) -6

B) -3

C) 3

D) 6

6

Which of the following numbers is NOT a solution to the inequality $2 - \frac{1}{2}x \le 2x + 7$?

A) -2.5

B) -0.5

C) 0.5

D) 2.5

7

During a basketball game, the Lancers scored 15 points in the first quarter, $\frac{2}{7}$ of their total score in the second quarter, $\frac{1}{4}$ of their total score in the third quarter, and the remaining 11 points in the fourth quarter. What is the total number of points the Lancers scored in the game?

A) 48

B) 53

C) 56

D) 60

8

	Distance from Burbank (miles)
Helicopter	$-150t + 260$
Plane	$-270t + 440$

The expressions in the table above show the distance from Burbank to a helicopter and a plane t hours after 10:00 AM. At what time will the helicopter and the plane be equidistant from Burbank?

A) 11:00 AM

B) 11:15 AM

C) 11:30 AM

D) 11:45 AM

Questions 9 and 10 refer to the following information.

A skier starts a downhill race course that is 1,800 meters long, and the finish line is 360 meters below the start line. During the race, the skier averaged a speed of 9 meters per second.

9

Which of the following expressions gives the skier's elevation above the finish line t seconds after she started the race?

A) $360 - 0.2t$

B) $360 - 1.8t$

C) $360 - 4.5t$

D) $360 - 9t$

10

How far is the skier from the finish line one minute after she started the race?

A) 540 meters

B) 780 meters

C) 1,020 meters

D) 1,260 meters

11
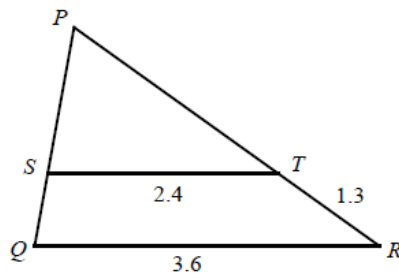
In the figure above, segments ST and QR are parallel. What is the length of $\overline{PT}$?

A) 2.6

B) 3.0

C) 3.4

D) 3.8

12

At a certain concert, all tickets are equally priced. A survey showed that decreasing the price of these tickets by 10 percent would increase the number of tickets sold by 20 percent. If each concert ticket is discounted by 10 percent, what is the percent increase in the amount of money received from the sale of tickets?

A) 8%

B) 10%

C) 12%

D) 15%

4

13

$$x - y = 5$$
$$y = (3x + 1)(x - 2)$$

How many ordered pairs (x, y) satisfy the system of equations shown above?

A) 0

B) 1

C) 2

D) Infinitely many

14

In the xy-plane, the graph of function f has x-intercepts at -3, 0, and 6. Which of the following could define f?

A) $f(x) = 2x^3 + 8x^2 - 24x$

B) $f(x) = 2x^3 - 8x^2 - 24x$

C) $f(x) = 2x^3 + 6x^2 - 36x$

D) $f(x) = 2x^3 - 6x^2 - 36x$

15

$$x - y = \frac{1}{2}y$$

If (x, y) is a solution to the equation above and $y \neq 0$, what is the ratio $\dfrac{x}{y}$?

A) $-\dfrac{3}{2}$

B) $-\dfrac{2}{3}$

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

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

16

Grape juice makes up 12% of brand A fruit punch and 20% of brand B fruit punch. If 10 ounces of brand A fruit punch are mixed with 15 ounces of brand B fruit punch, what percent of the mixed punch is the grape juice?

A) 14.2%

B) 15.4%

C) 16.8%

D) 20.6%

Questions 17 and 18 refer to the following information.

Metal	Density of materials $(\frac{g}{cm^3})$
aluminum	2.7
copper	9.0
gold	19.3
iron	7.9
mercury	13.6
silver	10.5

The chart above shows approximations of the density of metals, d, in grams per cubic centimeters $(\frac{g}{cm^3})$ for six metals. The mass of an object can be found by using the formula $m = d \cdot V$, in which m is the mass of a metal measured in grams and V is the volume of a metal measured in cm^3.

17

What is the volume, in cubic centimeters, of an aluminum with a mass of 5.4 kilograms? (1 kiligram=1,000 grams)

A) 1,450

B) 2,000

C) 14,500

D) 20,000

18

Which of the following metals with 630 grams of mass has approximately the same volume as gold with a mass of 1350 grams?

A) 630 grams of mercury

B) 630 grams of silver

C) 630 grams of copper

D) 630 grams of iron

19

A weather balloon was launched for weather forecast. At an elevation of 1,000 meters above the sea level, the outside temperature recorded $12°C$. As the balloon went up, the outside temperature decreased linearly. At an elevation of 1,500 meters above the sea level, outside temperature recorded $8.6°C$. If the temperature decreased at a constant rate as the balloon went up, which of the following models best describes temperature C at an elevation h meters above the sea level?

A) $C = -0.0136h + 25.6$

B) $C = -0.0272h + 15.2$

C) $C = -0.0068h + 18.8$
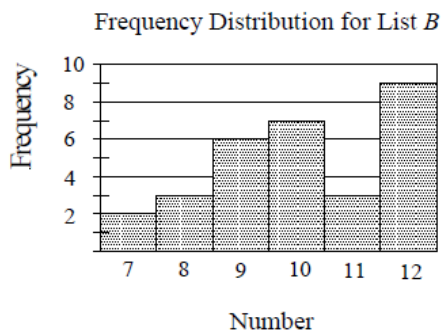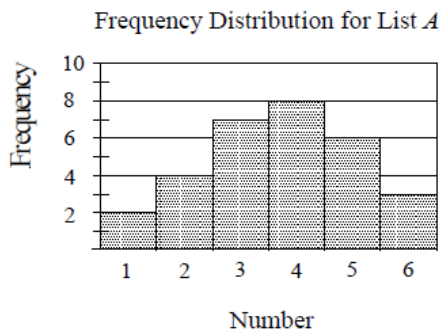
D) $C = -0.0034h + 15.4$

20

In a right triangle, one angle measures $x°$, for which $\cos x° = \frac{\sqrt{7}}{4}$. What is $\cos(90° - x°)$?

A) $\frac{\sqrt{3}}{4}$

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

C) $\frac{\sqrt{7}}{4}$

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

6

Questions 21 and 22 refer to the following information.

List A and List B each contains 30 numbers. Frequency distributions for each list are recorded in the histograms below.

Frequency Distribution for List A

Frequency Distribution for List B

The average (arithmetic mean) of the numbers in list A is 3.7, and the average of the numbers in list B is 10.1. List C contains 60 numbers: the 30 numbers of list A and the 30 numbers of list B.

21

Let M be the average and m be the median of the 60 numbers in list C. Which of the following relationships between M and m must be true?

A) $M > m$

B) $M < m$

C) $M = m$

D) The relationships between M and m cannot be determined.

22

Which of the following is true about the two lists shown for the 30 numbers?

A) The standard deviation of the numbers in list A is larger.

B) The standard deviation of the numbers in list B is larger.

C) The standard deviation of the numbers in list A is the same as that of list B.

D) The standard deviation of the numbers in the two lists cannot be determined.

23

$$y = 2(x - a)(x - b)$$

In the quadratic equation above, a and b are positive constants, with $a > b$. If the graph of the equation in the xy-plane is a parabola with vertex $(6, -18)$, what is the value of a?
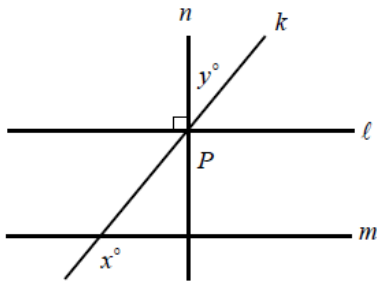
A) 3

B) 6

C) 9

D) 12

7

24

If an event can succeed in S ways and fail in F ways, the probability of success P is given as $P = \dfrac{S}{S+F}$. Which of the following expresses S in terms of the other variables?

A) $S = \dfrac{F}{P-1}$

B) $S = \dfrac{F}{1-P}$

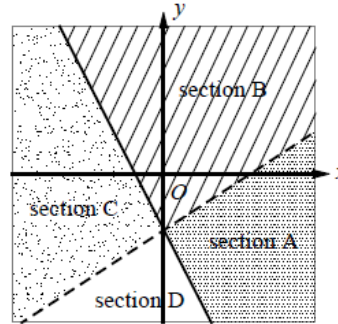C) $S = \dfrac{PF}{P-1}$

D) $S = \dfrac{PF}{1-P}$

25

In the figure above, lines k, ℓ, and n intersect at point P. If $\ell \parallel m$ and $\ell \perp n$, which of the following is true?

A) $x = 2y$

B) $x - y = 90$

C) $x + y = 90$

D) $180 - x = y$

26

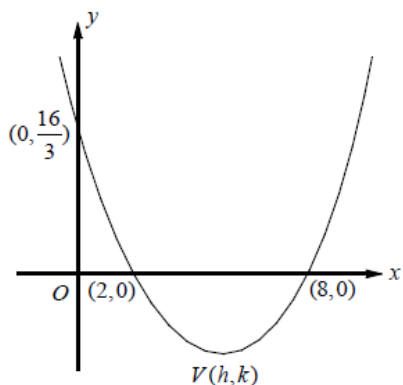$$\begin{cases} 2x + y \geq -1 \\ 2x - 3y < 3 \end{cases}$$

A system of inequalities and a graph are shown above. Which section or sections of the graph could represent all of the solutions to the system?

A) Section A

B) Section B

C) Section C

D) Section D

27

The xy-plane above shows two x-intercepts, a y-intercept, and vertex V of a parabola. Which of the following must be the coordinates of the vertex of the parabola?

A) $V(5,-3)$

B) $V(5,-\dfrac{10}{3})$

C) $V(5,-\dfrac{8}{3})$

D) $V(5,-2)$

28

	Ratings			
	1	2	3	Total
Group A	10	21	29	60
Group B	5	28	27	60
Total	15	49	56	120

The table above shows the number of people in two groups who rated a bestseller on a scale of 1 to 3.

If a person is chosen at random from those who gave a rating of at least 2, what is the probability that the person belongs to Group B ?

A) $\dfrac{49}{105}$

B) $\dfrac{50}{105}$

C) $\dfrac{55}{105}$

D) $\dfrac{56}{105}$

29

Printer A, working alone at a constant rate, prints 100 pages of documents in m minutes. Printer B, working alone at a constant rate, prints 100 pages of documents in n minutes. If printers A and B, working together at their respective constant rates, printed p pages of documents in 1 hour, which of the following equations describes p in terms of m and n?

A) $(\dfrac{m}{100} + \dfrac{n}{100})\dfrac{1}{60} = p$

B) $(100m + 100n)\dfrac{1}{60} = p$

C) $(100m + 100n)60 = p$

D) $(\dfrac{100}{m} + \dfrac{100}{n})60 = p$

30
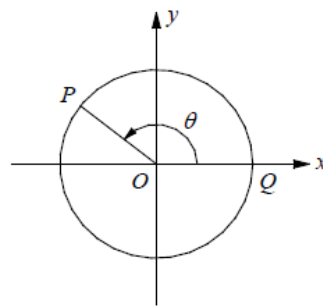
In the xy-plane above, O is the center of the circle, and the measure of $\angle POQ$ is θ. If $\sin \theta = \dfrac{a}{r}$, what is $\sin(2\pi - \theta)$?

A) $\dfrac{\sqrt{r^2 - a^2}}{r}$

B) $-\dfrac{\sqrt{r^2 - a^2}}{r}$

C) $-\dfrac{a}{r}$

D) $\dfrac{a}{r}$

Answers

SAT Practice Test 2 – Calculator

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