SAT 11 Key

Math

22 QUESTIONS

DIRECTIONS

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

* In similar Δ's corresponding ∠'s are ≅

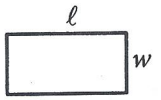
NOTES

Unless otherwise indicated:

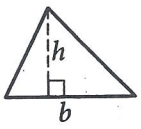
- All variables and expressions represent real numbers.
- Figures provided are drawn to scale.
- All figures lie in a plane.
- The domain of a given function f is the set of all real numbers x for which $f(x)$ is a real number.

REFERENCE

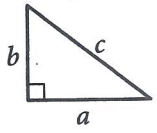
$A = \pi r^2$
$C = 2\pi r$



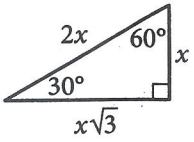
$A = \ell w$

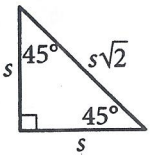


$A = \frac{1}{2}bh$

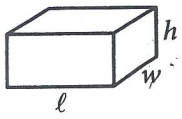


$c^2 = a^2 + b^2$

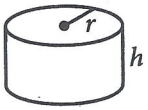




Special Right Triangles

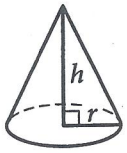


$V = \ell wh$

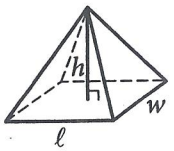


$V = \pi r^2 h$

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



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



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

The number of degrees of arc in a circle is 360.

The number of radians of arc in a circle is 2π.

The sum of the measures in degrees of the angles of a triangle is 180.

CONTINUE

1

Which expression is equivalent to $(2x^2 + x - 9) + (x^2 + 6x + 1)$?

A) $2x^2 + 7x + 10$
B) $2x^2 + 6x - 8$
C) $3x^2 + 7x - 10$
D) $3x^2 + 7x - 8$

$3x^2+7x-8$

2

John paid a total of \$165 for a microscope by making a down payment of \$37 plus p monthly payments of \$16 each. Which of the following equations represents this situation?

A) $16p - 37 = 165$
B) $37p - 16 = 165$
C) $16p + 37 = 165$
D) $37p + 16 = 165$

$16p+37=165$

3

$$7m = 2(n + p)$$

The given equation relates the positive numbers m, n, and p. Which equation correctly gives m in terms of n and p?

A) $m = \frac{2(n+p)}{7}$
B) $m = 2(n + p)$
C) $m = 2(n + p) - 7$
D) $m = 2 - n - p - 7$

$\frac{7m}{7} = \frac{2(n+p)}{7}$

$m = \frac{2(n+p)}{7}$

4

The function g is defined by $g(x) = \sqrt{8x + 1}$. What is the value of $g(3)$?

A) $\frac{5}{8}$
B) $\frac{25}{8}$
C) 5
D) 25

$g(3) = \sqrt{8(3)+1}$

$= \sqrt{24+1}$

$= \sqrt{25} = 5$

5

The table gives the distribution of votes for a new school mascot and grade level for 80 students.

Mascot	Grade level			
	Sixth	Seventh	Eighth	Total
Badger	4	9	9	22
Lion	9	2	9	20
Longhorn	4	6	4	14
Tiger	6	9	9	24
Total	23	26	31	80

If one of these students is selected at random, what is the probability of selecting a student whose vote for new mascot was for a lion?

A) $\frac{1}{9}$
B) $\frac{1}{5}$
C) $\frac{1}{4}$
D) $\frac{2}{3}$

$\frac{\#\text{ lion}}{\#\text{ total}} = \frac{20}{80} = \frac{1}{4}$

6

A student council group is selling school posters for a fundraiser. They use the function $p(x) = 5x - 220$ to determine their profit $p(x)$, in dollars, for selling x school posters. In order to earn a profit of \$900, how many school posters must they sell?

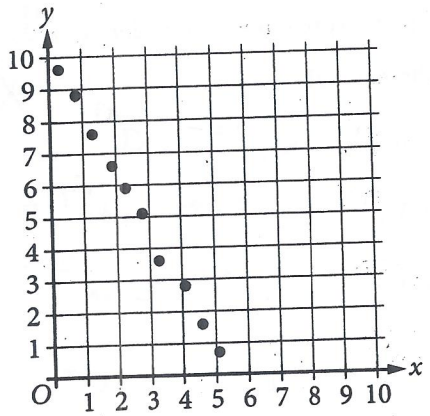
$900 = 5x - 220$

$1120 = 5x$

$x = 224$

CONTINUE

7



Which of the following equations is the most appropriate linear model for the data shown in the scatterplot?

A) $y = -1.9x - 10.1$
B) $y = -1.9x + 10.1$
C) $y = 1.9x - 10.1$
D) $y = 1.9x + 10.1$

y-int ≈ 10.1
Slope = Negative

8

$$3x + 6 = 4y$$
$$3x + 4 = 2y$$

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

$3x+6=4y$
$-(3x+4=2y)$
$2=2y$
$y=1$

9

Data value	Frequency
6	3
7	3
8	8
9	8
10	9
11	11
12	9
13	0
14	6

The frequency table summarizes the 57 data values in a data set. What is the maximum data value in the data set?

14

10

Circle K has a radius of 4 millimeters (mm). Circle L has an area of 100π mm^2. What is the total area, in mm^2, of circles K and L?

A) 14π
B) 28π
C) 56π
D) 116π

$A=\pi r^2$
K $A=16\pi$
L $A=100\pi$
total $=116\pi$

11

If $9(4 - 3x) + 2 = 8(4 - 3x) + 18$, what is the value of $4 - 3x$?

A) −16
B) −4
C) 4
D) 16

$9(4-3x)+2=8(4-3x)+18$
$-8(4-3x) \quad -8(4-3x)$
$(4-3x)+2=18$
$-2 \quad -2$
$4-3x=16$

CONTINUE

corresponding angles are ≅

12

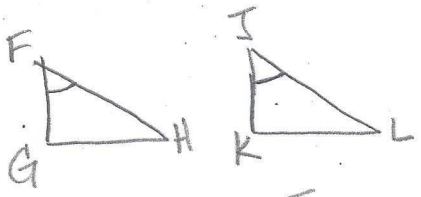
Triangle FGH is similar to triangle JKL, where angle F corresponds to angle J and angles G and K are right angles. If $\sin(F) = \frac{308}{317}$, what is the value of $\sin(J)$?

A) $\frac{75}{317}$

B) $\frac{308}{317}$

C) $\frac{317}{308}$

D) $\frac{317}{75}$



$\angle F \cong \angle J$

$\sin F = \sin J$

13

A wire with a length of 106 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 6 more than 4 times the value of y. What is the value of x?

A) 25

B) 28

C) 56

D) 86

$x + y = 106$

$x = 6 + 4y$

$6 + 4y + y = 106$

$6 + 5y = 106$

$5y = 100$

$y = 20$

$x = 6 + 4(20)$

$x = 86$

14

A certain township consists of a 5-hectare industrial park and a 24-hectare neighborhood. The total number of trees in the township is 4,529. The equation $5x + 24y = 4{,}529$ represents this situation. Which of the following is the best interpretation of x in this context?

A) The average number of trees per hectare in the industrial park

B) The average number of trees per hectare in the neighborhood

C) The total number of trees in the industrial park $= 5x$

D) The total number of trees in the neighborhood

15

Which expression is equivalent to $a^{\frac{11}{12}}$, where $a > 0$?

$x^{a/b} = \sqrt[b]{x^a}$

A) $\sqrt[12]{a^{132}} \rightarrow a^{\frac{132}{12}} = a^{11}$

B) $\sqrt[144]{a^{132}}$ $\quad a^{132/144} = a^{11/12}$

C) $\sqrt[121]{a^{132}}$ $\quad a^{132/121} \neq a^{12/11}$

D) $\sqrt[11]{a^{132}}$ $\quad a^{132/11} = a^{12}$

16

The function f is defined by $f(x) = (x - 6)(x - 2)(x + 6)$. In the xy-plane, the graph of $y = g(x)$ is the result of translating the graph of $y = f(x)$ up 4 units. What is the value of $g(0)$?

$g(x) = f(x) + 4$

$g(0) = f(0) + 4 = 72 + 4 = 76$

17

$y = 4x + 1$

$4y = 15x - 8$

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

$4(4x + 1) = 15x - 8$

$16x + 4 = 15x - 8$

$x = -12$

$y = 4(-12) + 1$

$-48 + 1$

$y = -47$

$x - y = -12 - (-47)$

35

CONTINUE

18

$$f(t) = 8{,}000(0.65)^t$$

The given function f models the number of coupons a company sent to their customers at the end of each year, where t represents the number of years since the end of 1998, and $0 \le t \le 5$. If $y = f(t)$ is graphed in the ty-plane, which of the following is the best interpretation of the y-intercept of the graph in this context?

when $x=0$

A) The minimum estimated number of coupons the company sent to their customers during the 5 years was 1,428.

B) The minimum estimated number of coupons the company sent to their customers during the 5 years was 8,000.

C) The estimated number of coupons the company sent to their customers at the end of 1998 was 1,428.

D) The estimated number of coupons the company sent to their customers at the end of 1998 was 8,000.

1998 is 8000

19

A landscaper uses a hose that puts $88x$ ounces of water in a bucket in $5y$ minutes. Which expression represents the number of ounces of water the hose puts in the bucket in $9y$ minutes at this rate?

A) $\frac{9x}{440}$

B) $\frac{440x}{9}$

C) $\frac{5x}{792}$

D) $\frac{792x}{5}$

$\frac{oz}{min}$ $\quad \frac{88x}{5y} = \frac{?}{9y}$

$5y(?) = 792xy$

$? = \frac{792xy}{5y}$

$= \frac{792x}{5}$

20

$$\sqrt{(x-2)^2} = \sqrt{3x+34}$$

Square both sides

What is the smallest solution to the given equation?

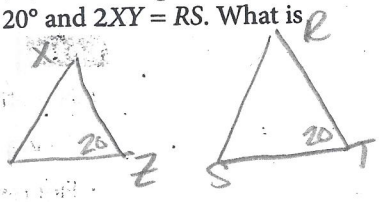
$x^2 - 4x + 4 = 3x + 34$ → $(x-10)(x+3)$

$x^2 - 7x - 30 = 0$ → $x = 10, -3$

-3

21

Triangle XYZ is similar to triangle RST such that X, Y, and Z correspond to R, S, and T, respectively. The measure of $\angle Z$ is 20° and $2XY = RS$. What is the measure of $\angle T$?



A) 2°

B) 10°

C) 20°

D) 40°

Similar △s → Corresponding ∠s are ≅

22

$$f(x) = 9(4)^x$$

The function f is defined by the given equation. If $g(x) = f(x+2)$, which of the following equations defines the function g?

A) $g(x) = 18(4)^x$

B) $g(x) = 144(4)^x$

C) $g(x) = 18(8)^x$

D) $g(x) = 81(16)^x$

$g(x) = f(x+2) = 9(4)^{x+2}$

$= 9(4^x)(4^2)$

$= 9(4^x)16$

$= 144(4^x)$

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

22 QUESTIONS

DIRECTIONS

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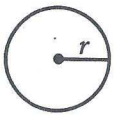
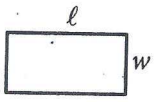


$A = \pi r^2$
$C = 2\pi r$



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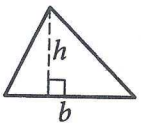

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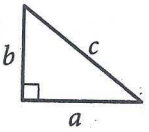
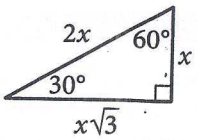
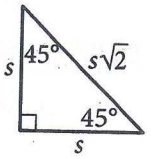
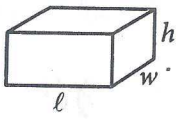


$c^2 = a^2 + b^2$

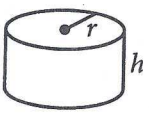




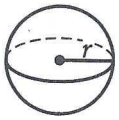
Special Right Triangles



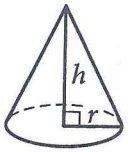
$V = \ell wh$



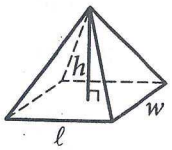
$V = \pi r^2 h$



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



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



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

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

$k + 12 = 336$

What is the solution to the given equation?

A) 28
B) 324
C) 348
D) 4,032

$k+12=336$
$-12 \quad -12$
$k=324$

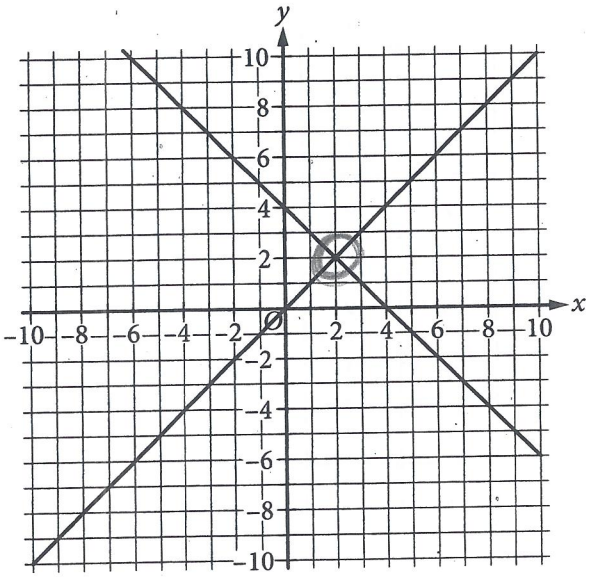
2

What length, in centimeters, is equivalent to a length of 51 meters? (1 meter = 100 centimeters)

A) 0.051
B) 0.51
C) 5,100
D) 51,000

$\frac{m}{cm} \quad \frac{1}{100} = \frac{51}{x}$

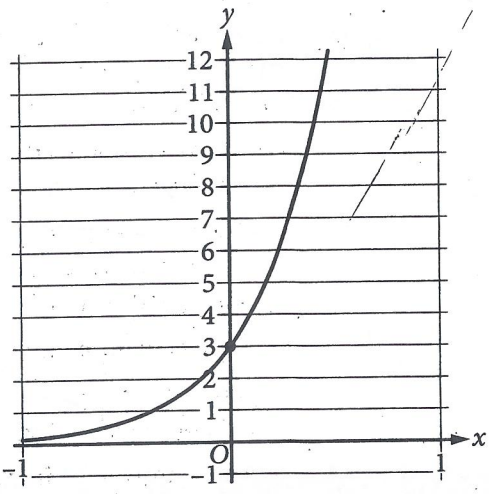
3



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

A) (0, 4)
B) (2, 2)
C) (4, 0)
D) (4, 4)

4

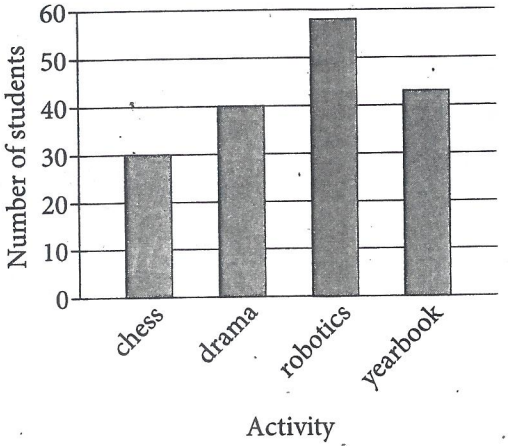


The graph of the exponential function f is shown, where $y = f(x)$. The y-intercept of the graph is $(0, y)$. What is the value of y?

$y = 3$

5

The bar graph shows the distribution of the number of students in each of four extracurricular activities at a high school.



How many more students are in drama than in chess?

A) 10
B) 30
C) 40
D) 70

$40 - 30 = 10$

CONTINUE

6

Which expression is equivalent to $\frac{8x(x-7)-3(x-7)}{2x-14}$, where $x > 7$?

A) $\frac{x-7}{5}$

B) $\frac{8x-3}{2}$

C) $\frac{8x^2-3x-14}{2x-14}$

D) $\frac{8x^2-3x-77}{2x-14}$

$= \frac{(8x-3)(x-7)}{2(x-7)}$

$= \frac{8x-3}{2}$

7

Out of 300 seeds that were planted, 80% sprouted. How many of these seeds sprouted?

80% of 300 = 0.8(300) = 240

8

Ty set a goal to walk at least 24 kilometers every day to prepare for a multiday hike. On a certain day, Ty plans to walk at an average speed of 4 kilometers per hour. What is the minimum number of hours Ty must walk on that day to fulfill the daily goal?

A) 4

B) 6

C) 20

D) 24

$RT = D$

$4(x) = 24$

$x = 6$ hours

9

$y = x + 4$

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

A)

x	y
0	4
1	5
2	6

B)

x	y
0	6
1	5
2	4

C)

x	y
0	2
1	1
2	0

D)

x	y
0	0
1	1
2	2

CONTINUE

10

The function g is defined by $g(x) = 6x$. For what value of x is $g(x) = 54$?

$54 = 6x$

$x = 9$

11

Sean rents a tent at a cost of \$11 per day plus a onetime insurance fee of \$10. Which equation represents the total cost c, in dollars, to rent the tent with insurance for d days?

A) $c = 11(d + 10)$

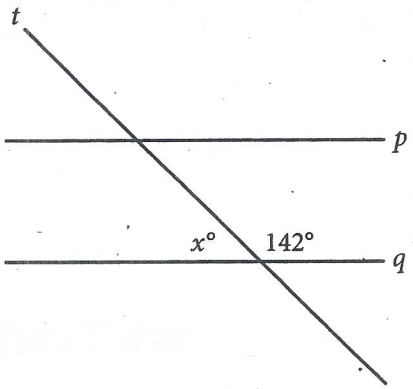
B) $c = 10(d + 11)$

C) $c = 11d + 10$

D) $c = 10d + 11$

$c = 11d + 10$

12



Note: Figure not drawn to scale.

In the figure, line p is parallel to line q, and line t intersects both lines. What is the value of $x + 142$?

A) 52

B) 90

C) 142

D) 180

13

What is the area, in square centimeters, of a rectangle with a length of 34 centimeters (cm) and a width of 29 cm?

$34(29) =$ 986

14

$45 = 0 + b$

$h(x) = x + b$

For the linear function h, b is a constant and $h(0) = 45$. What is the value of b?

$b = 45$

15

What is the equation of the line that passes through the point (0, 5) and is parallel to the graph of $y = 7x + 4$ in the xy-plane?

A) $y = 5x$

B) $y = 7x + 5$

C) $y = 7x$

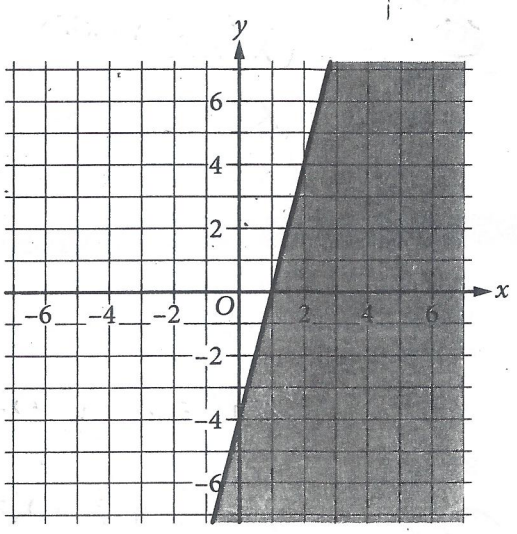
D) $y = 5x + 7$

$m = 7 \quad b = 5$

$y = mx + b$

$y = 7x + 5$

16



The shaded region shown represents the solutions to an inequality. Which ordered pair (x, y) is a solution to this inequality?

A) (−5, −6)

B) (−2, 5)

C) (1, 4)

D) (6, −2)

CONTINUE

17

The number of bacteria in a liquid medium doubles every day. There are 44,000 bacteria in the liquid medium at the start of an observation. Which of the following represents the number of bacteria, y, in the liquid medium t days after the start of the observation?

A) $y = \frac{1}{2}(44{,}000)^t$

B) $y = 2(44{,}000)^t$

C) $y = 44{,}000\left(\frac{1}{2}\right)^t$

D) $y = 44{,}000(2)^t$

18

The product of a positive number x and the number that is 8 more than x is 180. What is the value of x?

A) 5

B) 10

C) 18

D) 36

$x(x+8)=180$

$x^2+8x-180=0$

$(x+18)(x-10)=0$

19

$$(5x + 4)(2x - 5) = 0$$

Which of the following is a solution to the given equation?

A) $-\frac{5}{2}$

B) $-\frac{5}{4}$

C) $-\frac{4}{5}$

D) $-\frac{2}{5}$

$5x+4=0$ $\quad$ $2x-5=0$

$x=-\frac{4}{5}$ $\quad$ $x=5/2$

20

Keenan made 32 cups of vegetable broth. Keenan then filled x small jars and y large jars with all the vegetable broth he made. The equation $3x + 5y = 32$ represents this situation. Which is the best interpretation of $5y$ in this context?

A) The number of large jars Keenan filled

B) The number of small jars Keenan filled

C) The total number of cups of vegetable broth in the large jars

D) The total number of cups of vegetable broth in the small jars

21

The area A, in square centimeters, of a rectangular cutting board can be represented by the expression $w(w + 9)$, where w is the width, in centimeters, of the cutting board. Which expression represents the length, in centimeters, of the cutting board?

A) $w(w + 9)$

B) w

C) 9

D) $(w + 9)$

$A = \ell w$

$A = (w+9)w$

22

The measure of angle R is $\frac{2\pi}{3}$ radians. The measure of angle T is $\frac{5\pi}{12}$ radians greater than the measure of angle R. What is the measure of angle T, in degrees?

A) 75

B) 120

C) 195

D) 390

$T = \frac{5\pi}{12} + \frac{2\pi}{3}$

$= \frac{5\pi}{12} + \frac{8\pi}{12}$

$= \frac{13\pi}{12}$

$\pi = 180°$

$\frac{13(180)}{12} = 195°$

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

22 QUESTIONS

DIRECTIONS

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

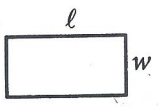
NOTES

Unless otherwise indicated:

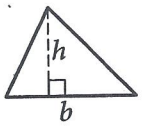
- All variables and expressions represent real numbers.
- Figures provided are drawn to scale.
- All figures lie in a plane.
- The domain of a given function f is the set of all real numbers x for which $f(x)$ is a real number.

REFERENCE

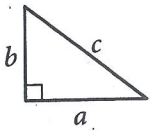
$A = \pi r^2$
$C = 2\pi r$



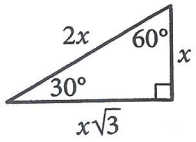
$A = \ell w$

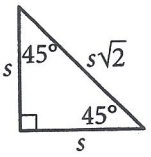


$A = \frac{1}{2}bh$

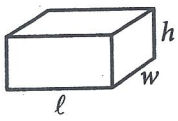


$c^2 = a^2 + b^2$

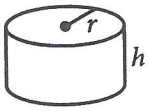




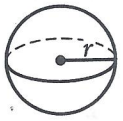
Special Right Triangles



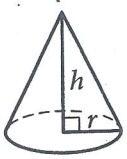
$V = \ell wh$



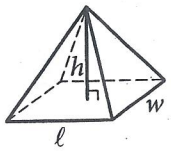
$V = \pi r^2 h$



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



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



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

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

73, 74, 75, 77, 79, 82, 84, 85, 91

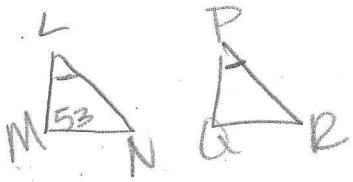
What is the median of the data shown?

79

2

Right triangles LMN and PQR are similar, where L and M correspond to P and Q, respectively. Angle M has a measure of 53°. What is the measure of angle Q?

A) 37°
B) 53°
C) 127°
D) 143°



3

x	y
1	11
2	19
3	a

The table shows three values of x and their corresponding values of y for the equation $y = 4(2)^x + 3$. In the table, a is a constant. What is the value of a?

A) 67
B) 35
C) 32
D) 27

Plug in $x=3$

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

$= 4(8) + 3$

$32 + 3 = 35$

4

$66x = 66x$

How many solutions does the given equation have?

A) Exactly one
B) Exactly two
C) Infinitely many
D) Zero

any value of x will work

5

A model predicts that the population of Bergen was 15,000 in 2005. The model also predicts that each year for the next 5 years, the population p increased by 4% of the previous year's population. Which equation best represents this model, where x is the number of years after 2005, for $x \leq 5$?

A) $p = 0.96(15{,}000)^x$
B) $p = 1.04(15{,}000)^x$
C) $p = 15{,}000(0.96)^x$
D) $p = 15{,}000(1.04)^x$

$a = 15000$

$b = 1 + r$

$1 + 0.04 = 1.04$

$y = 15000(1.04)^x$

6

The function h is defined by $h(x) = 4x + 28$. The graph of $y = h(x)$ in the xy-plane has an x-intercept at $(a, 0)$ and a y-intercept at $(0, b)$, where a and b are constants. What is the value of $a + b$?

A) 21
B) 28
C) 32
D) 35

$y = 4x + 28$

$b = 4(0) + 28$

$b = 28$

$0 = 4a + 28 \quad a = -7$

$a + b = 28 - 7 = 21$

7

Which expression is equivalent to $\dfrac{8x(x-7) - 3(x-7)}{2x - 14}$, where $x > 7$?

A) $\dfrac{x-7}{5}$
B) $\dfrac{8x-3}{2}$
C) $\dfrac{8x^2 - 3x - 14}{2x - 14}$
D) $\dfrac{8x^2 - 3x - 77}{2x - 14}$

$\dfrac{(8x-3)(x-7)}{2(x-7)}$

$\dfrac{8x-3}{2}$

CONTINUE

8

Circle A has a radius of $3n$ and circle B has a radius of $129n$, where n is a positive constant. The area of circle B is how many times the area of circle A?

A) 43
B) 86
C) 129
D) 1,849

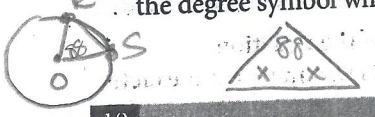
A: $A = \pi r^2 = \pi(3n)^2 = 9n^2\pi$

B: $A = \pi r^2$ $\pi(129n)^2 = 16641n^2\pi$

$\frac{16641}{9} =$

9

A circle has center O, and points R and S lie on the circle. In triangle ORS, the measure of $\angle ROS$ is 88°. What is the measure of $\angle RSO$, in degrees? (Disregard the degree symbol when entering your answer.)



$2x + 88 = 180$

$x = 46$

10

A business owner plans to purchase the same model of chair for each of the 81 employees. The total budget to spend on these chairs is $14,000, which includes a 7% sales tax. Which of the following is closest to the maximum possible price per chair, before sales tax, the business owner could pay based on this budget?

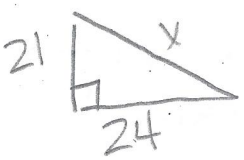
A) $148.15
B) $161.53
C) $172.84
D) $184.94

$81x(1.07) = 14000$

$x = \$161.53$

11

A right triangle has legs with lengths of 24 centimeters and 21 centimeters. If the length of this triangle's hypotenuse, in centimeters, can be written in the form $3\sqrt{d}$, where d is an integer, what is the value of d?



$21^2 + 24^2 = x^2$

$441 + 576 = x^2$

$1017 = x^2$

$9 \quad 113$

$x = \sqrt{9}\sqrt{113}$

$= 3\sqrt{113}$

$d = 113$

12

The positive number a is 230% of the number b, and a is 60% of the number c. If c is p% of b, which of the following is closest to the value of p?

A) 138
B) 217
C) 283
D) 383

$a = 2.3b$

$a = .6c$

$\frac{.6c}{.6} = \frac{2.3b}{.6}$ → $c = 3.833b$

13

For $x > 0$, the function f is defined as follows:

$f(x)$ equals 201% of x

Which of the following could describe this function?

A) Decreasing exponential
B) Decreasing linear
C) Increasing exponential
D) Increasing linear

$f(x) = 2.01x$

14

x	y
k	13
$k+7$	-15

The table gives the coordinates of two points on a line in the xy-plane. The y-intercept of the line is $(k-5, b)$, where k and b are constants. What is the value of b?

y-int: when $x = 0$

$k - 5 = 0$

$k = 5$

33

$(5, 13)$ & $(12, 15)$

$m = \frac{-15-13}{12-5} = \frac{-28}{7} = -4$

$y - 13 = -4(x - 5)$

$y - 13 = -4x + 20$

$y = -4x + 33$

CONTINUE

15

Keenan made 32 cups of vegetable broth. Keenan then filled x small jars and y large jars with all the vegetable broth he made. The equation $3x + 5y = 32$ represents this situation. Which is the best interpretation of $5y$ in this context?

A) The number of large jars Keenan filled
B) The number of small jars Keenan filled
C) The total number of cups of vegetable broth in the large jars
D) The total number of cups of vegetable broth in the small jars

16

$$3x = 36y - 45$$

One of the two equations in a system of linear equations is given. The system has no solution. Which equation could be the second equation in this system?

A) $x = 4y$
B) $\frac{1}{3}x = 4y$
C) $x = 12y - 15$
D) $\frac{1}{3}x = 12y - 15$

17

$$x - 29 = (x - a)(x - 29)$$

Which of the following are solutions to the given equation, where a is a constant and $a > 30$?

I. a
II. $a + 1$
III. 29

A) I and II only
B) I and III only
C) II and III only
D) I, II, and III

18

One gallon of stain will cover 170 square feet of a surface. A yard has a total fence area of w square feet. Which equation represents the total amount of stain S, in gallons, needed to stain the fence in this yard twice?

A) $S = \frac{w}{170}$
B) $S = 170w$
C) $S = 340w$
D) $S = \frac{w}{85}$

19

In the xy-plane, the graph of the equation $y = -x^2 + 9x - 100$ intersects the line $y = c$ at exactly one point. What is the value of c?

A) $-\frac{481}{4}$
B) -100
C) $-\frac{319}{4}$
D) $-\frac{9}{2}$

20

The quadratic function g models the depth, in meters, below the surface of the water of a seal t minutes after the seal entered the water during a dive. The function estimates that the seal reached its maximum depth of 302.4 meters 6 minutes after it entered the water and then reached the surface of the water 12 minutes after it entered the water. Based on the function, what was the estimated depth, to the nearest meter, of the seal 10 minutes after it entered the water?

168

CONTINUE

21

The area of a rectangular region is increasing at a rate of 250 square feet per hour. Which of the following is closest to this rate in square meters per minute? (Use 1 meter = 3.28 feet.)

A) 0.39
B) 1.27
C) 13.67
D) 23.24

$$\frac{250\ ft^2}{1\ hr} \cdot \frac{1\ hr}{60\ min} \cdot \left(\frac{1\ m}{3.28\ ft}\right)^2$$

$$= 0.387\ m^2/min$$

22

$5x + 7y = 1$ → slope $= -5/7$

$ax + by = 1$ → slope $= -a/b$

In the given pair of equations, a and b are constants. The graph of this pair of equations in the xy-plane is a pair of perpendicular lines. Which of the following pairs of equations also represents a pair of perpendicular lines?

$-\frac{5}{7} = \frac{b}{a}$

A) $10x + 7y = 1$ → $-10/7$
$ax - 2by = 1$ → $a/2b$

B) $10x + 7y = 1$
$ax + 2by = 1$ → slope $= -\frac{10}{7}$, slope $= -\frac{a}{2b}$

C) $10x + 7y = 1$
$2ax + by = 1$

D) $5x - 7y = 1$
$ax + by = 1$

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.

SAT Practice Test Worksheet: Answer Key

Mark each of your correct answers below, then add them up to get your raw score on each module. **As a reminder, use only the answer key for the second-stage module you chose to complete as part of your practice test, either module 2 (lower difficulty) or module 2 (higher difficulty).** Please note that the questions that appear in grayed-out rows below are unscored questions for research purposes. Do not consider these questions when calculating your raw scores. (Because of these unscored questions, the answer key has two more questions than the conversion tables.) Finally, add your scores from your two modules together to get your raw score for each section.

MATH

Module 1 (Routing)

QUESTION #	CORRECT	MARK YOUR CORRECT ANSWERS
1	D	
2	C	
3	A	
4	C	
5	C	
6	224	
7	B	
8	1	
9	14	
10	D	
11	D	
12	B	
13	D	
14	A	
15	B	
16	76	
17	35	
18	D	
19	D	
20	-3	
21	C	
22	B	

Module 2 (Lower Difficulty)

QUESTION #	CORRECT	MARK YOUR CORRECT ANSWERS
1	B	
2	C	
3	B	
4	3	
5	A	
6	B	
7	240	
8	B	
9	A	
10	9	
11	C	
12	D	
13	986	
14	45	
15	B	
16	D	
17	D	
18	B	
19	C	
20	C	
21	D	
22	C	

Module 2 (Higher Difficulty)

QUESTION #	CORRECT	MARK YOUR CORRECT ANSWERS
1	79	
2	B	
3	B	
4	C	
5	D	
6	A	
7	B	
8	D	
9	46	
10	B	
11	113	
12	D	
13	D	
14	33	
15	C	
16	B	
17	C	
18	D	
19	C	
20	168	
21	A	
22	B	

						MATH SECTION RAW SCORE (Total # of Correct Answers)
	+		OR		=	
Module 1 (Routing)		Module 2 (Lower Difficulty)		Module 2 (Higher Difficulty)		

SAT 12

Math

22 QUESTIONS

DIRECTIONS

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

NOTES

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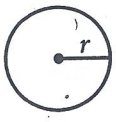
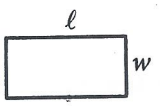
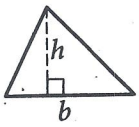
REFERENCE



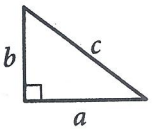
$A = \pi r^2$
$C = 2\pi r$



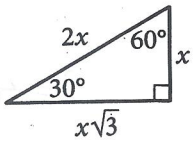
$A = \ell w$

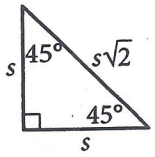


$A = \frac{1}{2}bh$

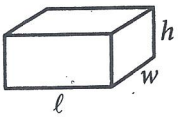


$c^2 = a^2 + b^2$

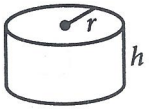




Special Right Triangles

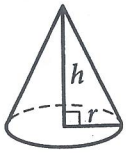


$V = \ell wh$

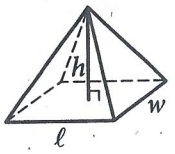


$V = \pi r^2 h$

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



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



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

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

For a particular machine that produces beads, 29 out of every 100 beads it produces have a defect. A bead produced by the machine will be selected at random. What is the probability of selecting a bead that has a defect?

A) $\frac{1}{2,900}$

B) $\frac{1}{29}$

C) $\frac{29}{100}$

D) $\frac{29}{10}$

$\frac{\#\text{ defect}}{\#\text{ total}} = \frac{29}{100}$

2

$s = 40 + 3t$

The equation gives the speed s, in miles per hour, of a certain car t seconds after it began to accelerate. What is the speed, in miles per hour, of the car 5 seconds after it began to accelerate?

A) 40

B) 43

C) 45

D) 55

$t = 5$

$s = 40 + 3(5)$

$= 40 + 15 = 55$

3

If $4x = 3$, what is the value of $24x$?

A) $\frac{9}{2}$

B) 6

C) 18

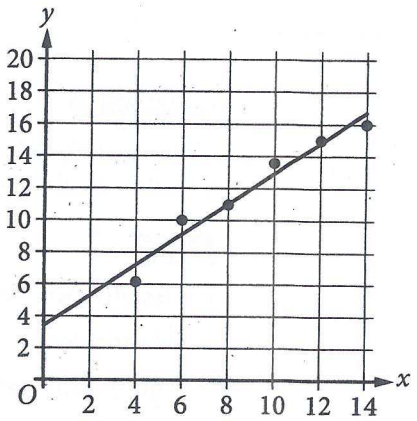
D) 72

$6(4x) = 6(3)$

$24x = 18$

4

The scatterplot shows the relationship between two variables, x and y. A line of best fit is also shown.



Which of the following equations best represents the line of best fit shown?

A) $y = x + 3.4$

B) $y = x - 3.4$

C) $y = -x + 3.4$

D) $y = -x - 3.4$

y-int ≈ 3.4

slope = positive

5

Of 300,000 paper clips, 234,000 are size large. What percentage of the paper clips are size large?

A) 22%

B) 33%

C) 66%

D) 78%

$\frac{\#\text{ large}}{\#\text{ total}} = \frac{234,000}{300,000}$

$= 0.78$

CONTINUE

6

x	y
0	18
1	13
2	8

The table shows three values of x and their corresponding values of y. There is a linear relationship between x and y. Which of the following equations represents this relationship?

A) $y = 18x + 13$
B) $y = 18x + 18$
C) $y = -5x + 13$
D) $y = -5x + 18$

7

The function f is defined by $f(x) = x^2 + x + 71$. What is the value of $f(2)$?

8

Which expression is equivalent to $(m^4q^4z^{-1})(mq^5z^3)$, where m, q, and z are positive?

A) $m^4q^{20}z^{-3}$
B) $m^5q^9z^2$
C) $m^6q^8z^{-1}$
D) $m^{20}q^{12}z^{-2}$

9

Triangle ABC is similar to triangle XYZ, where A, B, and C correspond to X, Y, and Z, respectively. In triangle ABC, the length of $\overline{AB}$ is 170 and the length of $\overline{BC}$ is 850. In triangle XYZ, the length of $\overline{YZ}$ is 60. What is the length of $\overline{XY}$?

A) 204
B) 182
C) 60
D) 12

10

If $\frac{x}{y} = 4$ and $\frac{24x}{ny} = 4$, what is the value of n?

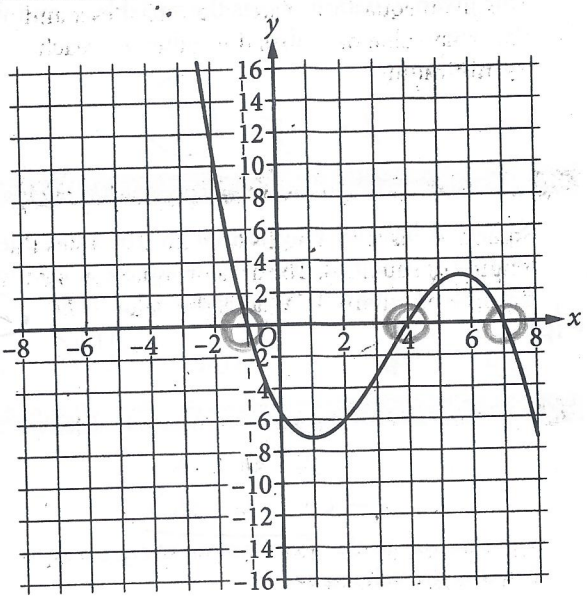
11

$$w(t) = 300 - 4t$$

The function w models the volume of liquid, in milliliters, in a container t seconds after it begins draining from a hole at the bottom. According to the model, what is the predicted volume, in milliliters, draining from the container each second?

A) 300
B) 296
C) 75
D) 4

12



The graph of $y = f(x)$ is shown, where the function f is defined by $f(x) = ax^3 + bx^2 + cx + d$ and a, b, c, and d are constants. For how many values of x does $f(x) = 0$?

A) One
B) Two
C) Three
D) Four

CONTINUE

$y = ab^x$ a = initial value (when $x=0$)

13

$f(x) = 3{,}000(0.75)^x$

A conservation scientist implemented a program to reduce the population of a certain species in an area. The given function estimates this species' population x years after 2008, where $x \leq 8$. Which of the following is the best interpretation of 3,000 in this context?

A) The estimated percent decrease in the population for this species and area every 8 years after 2008

B) The estimated percent decrease in the population for this species and area each year after 2008

C) The estimated population for this species and area 8 years after 2008

D) The estimated initial population for this species and area in 2008

0 years after 2008, population = 3000

14

$y = x^2 - 14x + 22$ $\quad x = \frac{-b}{2a}$

The given equation relates the variables x and y. For what value of x does the value of y reach its minimum?

$x = \frac{14}{2} = 7$

15

Square A has side lengths that are 166 times the side lengths of square B. The area of square A is k times the area of square B. What is the value of k?

Ratio of Sides = a/b
Ratio of areas = a^2/b^2
Sides = $\frac{166}{1}$ Area = $\frac{166^2}{1^2}$ = 27556

16

$2a + 8b = 198$

$-(2a + 4b = 98)$

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

$4b = 100$

$b = 25$

17

The function f is defined by $f(x) = (-8)(2)^x + 22$. What is the y-intercept of the graph of $y = f(x)$ in the xy-plane?

↳ when $x=0$

A) (0, 14)
B) (0, 2)
C) (0, 22)
D) (0, −8)

$= -8(2)^0 + 22$
$= -8 + 22$
$= 14$

18

Two variables, x and y, are related such that for each increase of 1 in the value of x, the value of y increases by a factor of 4. When $x = 0$, $y = 200$. Which equation represents this relationship?

b

↳ initial value = a

A) $y = 4(x)^{200}$
B) $y = 4(200)^x$
C) $y = 200(x)^4$
D) $y = 200(4)^x$

$y = ab^x$
$y = 200(4)^x$

19

What is the value of $\sin 42\pi$?

A) 0
B) $\frac{1}{2}$
C) $\frac{\sqrt{2}}{2}$
D) 1

$\sin 42\pi = \sin 0 = 0$

* use calc in radian mode

20

$4x - 9y = 9y + 5$

$hy = 2 + 4x$

In the given system of equations, h is a constant. If the system has no solution, what is the value of h?

A) −9
B) 0
C) 9
D) 18

$4x - 18y = 5$
$4x - hy = -2$

$\frac{4}{4} = \frac{-18}{-h}$

CONTINUE

21

$$x^2 - 2x - 9 = 0$$

One solution to the given equation can be written as $1 + \sqrt{k}$, where k is a constant. What is the value of k?

A) 8
B) 10
C) 20
D) 40

$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{2 \pm \sqrt{(-2)^2 - 4(-9)}}{2}$

$= \frac{2 \pm \sqrt{40}}{2}$

$= \frac{2 \pm 2\sqrt{10}}{2}$

$= 1 \pm \sqrt{10}$

22

$$\frac{x^2}{\sqrt{x^2 - c^2}} = \frac{c^2}{\sqrt{x^2 - c^2}} + 39$$

In the given equation, c is a positive constant. Which of the following is one of the solutions to the given equation?

A) $-c$
B) $-c^2 - 39^2$
C) $-\sqrt{39^2 - c^2}$
D) $-\sqrt{c^2 + 39^2}$

$\frac{x^2}{\sqrt{x^2 - c^2}} = \frac{c^2}{\sqrt{x^2 - c^2}} + 39$

$\frac{x^2 - c^2}{\sqrt{x^2 - c^2}} = 39$

$\frac{(x^2 - c^2)^1}{(x^2 - c^2)^{1/2}} = (x^2 - c^2)^{1/2}$

$\sqrt{x^2 - c^2} = 39$

$x^2 - c^2 = 39^2$

$x^2 = 39^2 + c^2$

$x = \pm\sqrt{c^2 + 39^2}$

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

22 QUESTIONS

DIRECTIONS

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

NOTES

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- Figures provided are drawn to scale.
- All figures lie in a plane.
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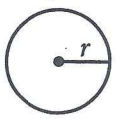
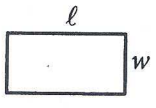
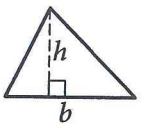
REFERENCE



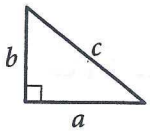
$A = \pi r^2$
$C = 2\pi r$



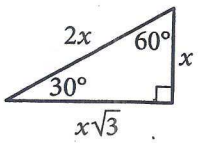
$A = \ell w$

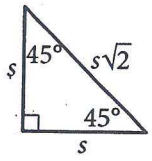


$A = \frac{1}{2}bh$

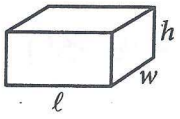


$c^2 = a^2 + b^2$

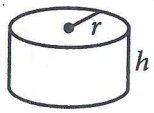




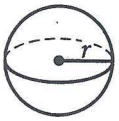
Special Right Triangles



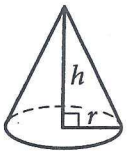
$V = \ell wh$



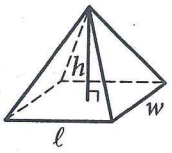
$V = \pi r^2 h$



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



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



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

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

$4x + 5 = 165$

What is the solution to the given equation?

$4x = 160$ $x = (40)$

2

Type of store	Average number of employees
Warehouse store	365
Department store	213
Supermarket	130

For a certain region, the table shows the average number of store employees in 2016 by type of store. Based on the table, how much greater was the average number of store employees in warehouse stores than in supermarkets?

A) 83
B) 152
C) 235
D) 495

$365 - 130 = 235$

3

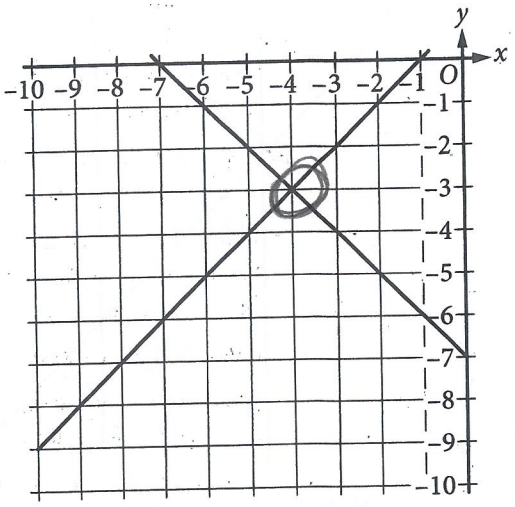
Julissa needs at least 100 hours of flight time to get her private pilot certification. If Julissa already has 86 hours of flight time, what is the minimum number of additional hours of flight time Julissa needs to get her private pilot certification?

A) 14
B) 76
C) 86
D) 186

$100 - 86 = 14$

$x + 86 \geq 100$
$x \geq 14$

4



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

A) (0, −7)
B) (0, −3)
C) (−4, −3)
D) (−4, 0)

5

A giant armadillo has a mass of 39 kilograms. What is the giant armadillo's mass in **grams**? (1 kilogram = 1,000 grams)

$\frac{kg}{g}$ $\frac{1}{1000} = \frac{39}{x}$ $x = 39000$

6

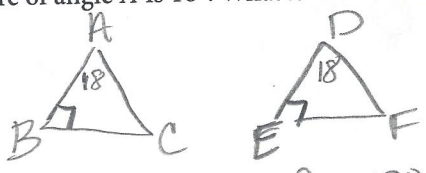
The function f is defined by $f(x) = 4x$. For what value of x does $f(x) = 8$?

$8 = 4x$ $x = (2)$

7

Triangles ABC and DEF are congruent, where A corresponds to D, and B and E are right angles. The measure of angle A is 18°. What is the measure of angle F?

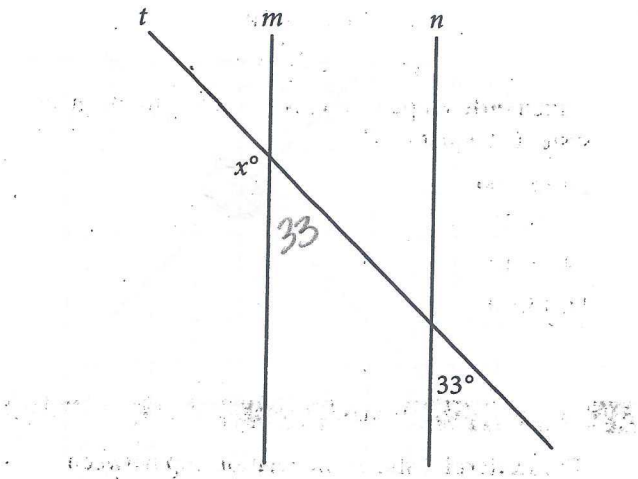
A) 18°
B) 72°
C) 90°
D) 162°



$90 + 18 + f = 180$

CONTINUE

8



Note: Figure not drawn to scale.

In the figure, line m is parallel to line n, and line t intersects both lines. What is the value of x?

A) 33
B) 57
C) 123
D) 147

180 − 33 = 147

9

$$3x = 12$$
$$-3x + y = -6$$

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

A) −3
B) 6
C) 18
D) 30

y = 6

10

Which expression is equivalent to $9x^2 + 5x$?

A) $x(9x + 5)$
B) $5x(9x + 1)$
C) $9x(x + 5)$
D) $x^2(9x + 5)$

x(9x+5)

11

Jay walks at a speed of 3 miles per hour and runs at a speed of 5 miles per hour. He walks for w hours and runs for r hours for a combined total of 14 miles. Which equation represents this situation?

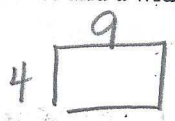
A) $3w + 5r = 14$
B) $\frac{1}{3}w + \frac{1}{5}r = 14$
C) $\frac{1}{3}w + \frac{1}{5}r = 112$
D) $3w + 5r = 112$

RT=D
3w+5r=14

12

What is the perimeter, in inches, of a rectangle with a length of 4 inches and a width of 9 inches?

A) 13
B) 17
C) 22
D) 26



2(4+9) = 2(13) = 26

13

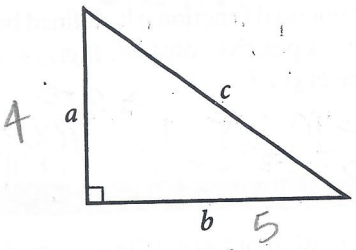
A line in the xy-plane has a slope of $\frac{1}{9}$ and passes through the point (0, 14). Which equation represents this line?

A) $y = -\frac{1}{9}x - 14$
B) $y = -\frac{1}{9}x + 14$
C) $y = \frac{1}{9}x - 14$
D) $y = \frac{1}{9}x + 14$

y=mx+b
m=1/9 b=14
y=1/9x+14

CONTINUE

14



Note: Figure not drawn to scale.

For the right triangle shown, $a = 4$ and $b = 5$. Which expression represents the value of c?

A) $4 + 5$

B) $\sqrt{(4)(5)}$

C) $\sqrt{4 + 5}$

D) $\sqrt{4^2 + 5^2}$

15

Vivian bought party hats and cupcakes for $71. Each package of party hats cost $3, and each cupcake cost $1. If Vivian bought 10 packages of party hats, how many cupcakes did she buy?

16

The function f is defined by $f(x) = 7x^3$. In the xy-plane, the graph of $y = g(x)$ is the result of shifting the graph of $y = f(x)$ down 2 units. Which equation defines function g?

A) $g(x) = \frac{7}{2}x^3$

B) $g(x) = 7x^{\frac{3}{2}}$

C) $g(x) = 7x^3 + 2$

D) $g(x) = 7x^3 - 2$

17

$x + 7 = 10$

$(x + 7)^2 = y$

Which ordered pair (x, y) is a solution to the given system of equations?

A) (3, 100)

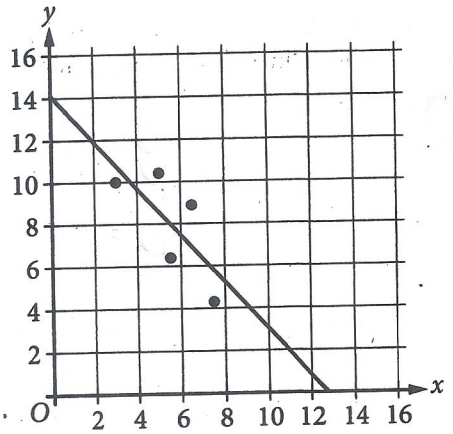
B) (3, 3)

C) (3, 10)

D) (3, 70)

18

The scatterplot shows the relationship between two variables, x and y. A line of best fit is also shown.



Which of the following is closest to the slope of this line of best fit?

A) −3.3

B) −1.1

C) 1.1

D) 3.3

same slope different y-int

19

$y = 6x + 18$

One of the equations in a system of two linear equations is given. The system has no solution. Which equation could be the second equation in the system?

A) $-6x + y = 18$
B) $-6x + y = 22$ → $y = 6x + 22$
C) $-12x + y = 36$
D) $-12x + y = 18$

20

The function f is defined by $f(x) = 7x - 84$. What is the x-intercept of the graph of $y = f(x)$ in the xy-plane?

A) $(-12, 0)$
B) $(-7, 0)$
C) $(7, 0)$
D) $(12, 0)$

$y = 0$

$f(x) = 7x - 84$
$y = 7x - 84$
$0 = 7x - 84$
$84 = 7x$
$x = 12$

21

The exponential function g is defined by $g(x) = 19 \cdot a^x$, where a is a positive constant. If $g(3) = 2{,}375$, what is the value of $g(4)$?

$2375 = 19(a)^3$ → $a = 5$
$125 = a^3$
$g(x) = A(5)^x$
$g(4) = 19(5)^4 =$ 11875

22

The population of Greenville increased by 7% from 2015 to 2016. If the 2016 population is k times the 2015 population, what is the value of k?

A) 0.07
B) 0.7
C) 1.07
D) 1.7

$k = 1 + r$
$= 1 + 0.07$
$= 1.07$

STOP

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Math

22 QUESTIONS

DIRECTIONS

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

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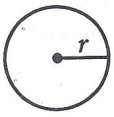
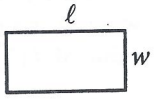
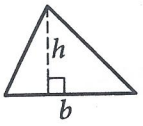


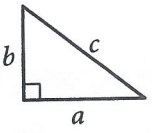
$A = \pi r^2$
$C = 2\pi r$



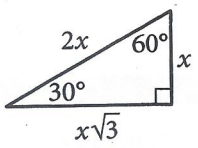
$A = \ell w$

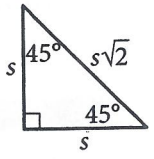


$A = \frac{1}{2}bh$

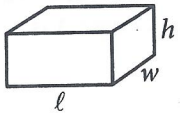


$c^2 = a^2 + b^2$

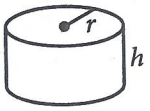




Special Right Triangles

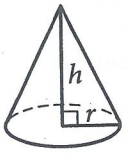


$V = \ell wh$

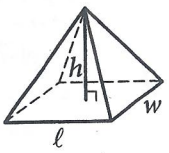


$V = \pi r^2 h$

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



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



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

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

An airplane descends from an altitude of 9,500 feet to 5,000 feet at a constant rate of 400 feet per minute. What type of function best models the relationship between the descending airplane's altitude and time?

A) Decreasing exponential
B) Decreasing linear
C) Increasing exponential
D) Increasing linear

Slope
9500 → 5000
decreasing

2

Line k is defined by $y = \frac{17}{7}x + 4$. Line j is parallel to line k in the xy-plane. What is the slope of line j?

A) $\frac{7}{17}$
B) $\frac{17}{7}$
C) 4
D) 17

parallel lines = same slope

3

Caleb used juice to make popsicles. The function $f(x) = -5x + 30$ approximates the volume, in fluid ounces, of juice Caleb had remaining after making x popsicles. Which statement is the best interpretation of the y-intercept of the graph of $y = f(x)$ in the xy-plane in this context?

A) Caleb used approximately 5 fluid ounces of juice for each popsicle.
B) Caleb had approximately 5 fluid ounces of juice when he began to make the popsicles.
C) Caleb had approximately 30 fluid ounces of juice when he began to make the popsicles.
D) Caleb used approximately 30 fluid ounces of juice for each popsicle.

When $x=0$

$x = 0$ popsicles
$y = 30$ oz

4

A physics class is planning an experiment about a toy rocket. The equation $y = -16(x - 5.6)^2 + 502$ gives the estimated height y, in feet, of the toy rocket x seconds after it is launched into the air. Which of the following is the best interpretation of the vertex of the graph of the equation in the xy-plane?

A) This toy rocket reaches an estimated maximum height of 502 feet 16 seconds after it is launched into the air.
B) This toy rocket reaches an estimated maximum height of 502 feet 5.6 seconds after it is launched into the air.
C) This toy rocket reaches an estimated maximum height of 16 feet 502 seconds after it is launched into the air.
D) This toy rocket reaches an estimated maximum height of 5.6 feet 502 seconds after it is launched into the air.

opens down
(5.6, 502)
(5.6 sec, 502 ft)

5

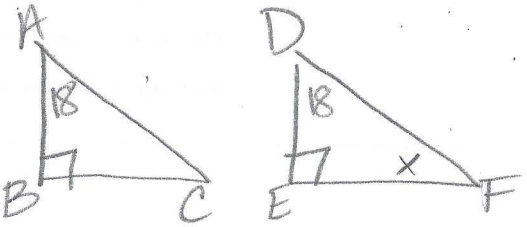
The function f is defined by $f(x) = 4x + k(x - 1)$, where k is a constant, and $f(5) = 32$. What is the value of $f(10)$?

$32 = 4(5) + k(5-1)$
$12 = 4k$
$k = 3$
$f(x) = 4x + 3(x-1)$
$f(10) = 40 + 27$
67

6

Triangles ABC and DEF are congruent, where A corresponds to D, and B and E are right angles. The measure of angle A is 18°. What is the measure of angle F?

A) 18°
B) 72°
C) 90°
D) 162°



$x + 90 + 18 = 180$
$x = 72$

CONTINUE

7

$y \leq x + 7$

$y \geq -2x - 1$

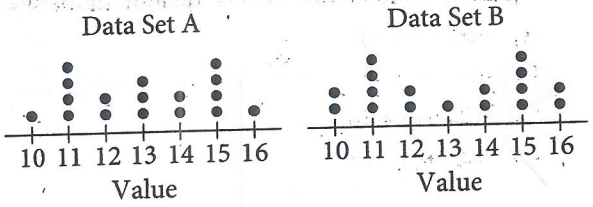
Which point (x, y) is a solution to the given system of inequalities in the xy-plane?

A) $(-14, 0)$
B) $(0, -14)$
C) $(0, 14)$
D) $(14, 0)$

Plug into both Equations!
$0 \leq 14+7$ ✓
$0 \geq -2(14)-1$ ✓

8

The dot plots represent the distributions of values in data sets A and B.



Which of the following statements must be true?

I. The median of data set A is equal to the median of data set B.
II. The standard deviation of data set A is equal to the standard deviation of data set B.

A) I only
B) II only
C) I and II
D) Neither I nor II

9

A scientist initially measures 12,000 bacteria in a growth medium. 4 hours later, the scientist measures 24,000 bacteria. Assuming exponential growth, the formula $P = C(2)^{rt}$ gives the number of bacteria in the growth medium, where r and C are constants and P is the number of bacteria t hours after the initial measurement. What is the value of r?

A) $\frac{1}{12{,}000}$
B) $\frac{1}{4}$
C) 4
D) 12,000

$P = 12000(2)^{rt}$ ← (4, 24000)
$24000 = 12000(2)^{4r}$
$2 = 2^{4r}$
$1 = 4r$ → $r = \frac{1}{4}$

10

A cube has a volume of 474,552 cubic units. What is the surface area, in square units, of the cube?

$S^3 = 474{,}552$ $S = 78$ $A = 6S^2 = 6(78)^2 =$ 36504

11

$2(8x) + 4(7y) = 12$
$-2(8x) + 4(7y) = 12$

$8(7y) = 24$
$7y = 3$

The solution to the given system of equations is (x, y). What is the value of $8x + 7y$?

$3 + 0 =$ 3

$2(8x) + 12 = 12$
$2(8x) = 0$
$8x = 0$

12

A certain town has an area of 4.36 square miles. What is the area, in square yards, of this town? (1 mile = 1,760 yards)

A) 404
B) 7,674
C) 710,459
D) 13,505,536

$4.36\ m^2 \cdot \frac{1760\ yd}{1\ mi} \cdot \frac{1760\ yd}{1\ mi} =$

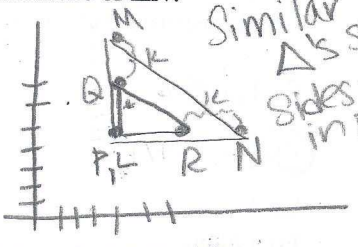
13,505,536

CONTINUE

13

Triangles PQR and LMN are graphed in the xy-plane. Triangle PQR has vertices P, Q, and R at (4, 5), (4, 7), and (6, 5), respectively. Triangle LMN has vertices L, M, and N at (4, 5), (4, 7 + k), and (6 + k, 5), respectively, where k is a positive constant. If the measure of $\angle Q$ is $t°$, what is the measure of $\angle N$?

A) $(90 - (t - k))°$
B) $(90 - (t + k))°$
C) $(90 - t)°$
D) $(90 + k)°$



Similar Δ's since sides are in prop.

14

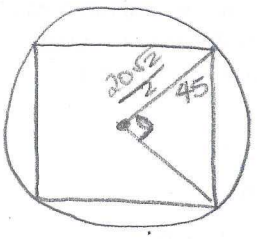
A small business owner budgets \$2,200 to purchase candles. The owner must purchase a minimum of 200 candles to maintain the discounted pricing. If the owner pays \$4.90 per candle to purchase small candles and \$11.60 per candle to purchase large candles, what is the maximum number of large candles the owner can purchase to stay within the budget and maintain the discounted pricing?

182

15

A square is inscribed in a circle. The radius of the circle is $\frac{20\sqrt{2}}{2}$ inches. What is the side length, in inches, of the square?

A) 20
B) $\frac{20\sqrt{2}}{2}$
C) $20\sqrt{2}$
D) 40

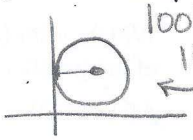


$\frac{20\sqrt{2}}{2} \cdot \sqrt{2} = \frac{40}{2} = 20$

16

Which of the following equations represents a circle in the xy-plane that intersects the y-axis at exactly one point?

A) $(x - 8)^2 + (y - 8)^2 = 16$
B) $(x - 8)^2 + (y - 4)^2 = 16$
C) $(x - 4)^2 + (y - 9)^2 = 16$
D) $x^2 + (y - 9)^2 = 16$



$h = r$
$(x-h)^2+(y-k)^2=r^2$

17

$y = 6x + 18$

One of the equations in a system of two linear equations is given. The system has no solution. Which equation could be the second equation in the system?

same slope, diff y-int

A) $-6x + y = 18$
B) $-6x + y = 22$
C) $-12x + y = 36$
D) $-12x + y = 18$

$y = 6x + 22$

18

Which expression is equivalent to $\frac{y + 12}{x - 8} + \frac{y(x - 8)}{x^2y - 8xy}$?

A) $\frac{xy + y + 4}{x^3y - 16x^2y + 64xy}$
B) $\frac{xy + 9y + 12}{x^2y - 8xy + x - 8}$
C) $\frac{xy^2 + 13xy - 8y}{x^2y - 8xy}$
D) $\frac{xy^2 + 13xy - 8y}{x^3y - 16x^2y + 64xy}$

$xy(x-8)$

$\frac{xy(y+12)}{xy(x-8)} + \frac{y(x-8)}{xy(x-8)}$

$\frac{xy^2+12xy+xy-8y}{xy(x-8)} = \frac{xy^2+13xy-8y}{x^2y-8xy}$

$x+y \geq 200$
$4.9x + 11.6y = 2200$
(17.9, 182.1)

CONTINUE

19

$pqrs\left(\frac{20}{p}=\frac{20}{q}-\frac{20}{r}-\frac{20}{s}\right)$

The given equation relates the positive variables p, q, r, and s. Which of the following is equivalent to q?

A) $p+r+s$

B) $20(p+r+s)$

C) $\frac{prs}{pr+ps+rs}$

D) $\frac{prs}{20p+20r+20s}$

$20qrs = 20prs - 20pqs - 20pqr$

$qrs = prs - pqs - pqr$

$qrs + pqr + pqs = prs$

$q(rs+pr+ps) = prs$

20

$x(kx-56)=-16$

In the given equation, k is an integer constant. If the equation has no real solution, what is the least possible value of k?

$kx^2 - 56k + 16 = 0$

$b^2 - 4ac < 0$

$(-56)^2 - 4(k)(16) < 0$

$3136 - 64k < 0$

$3136 < 64k$

$49 < k$

50

21

$2x+3y=7$

$10x+15y=35$

For each real number r, which of the following points lies on the graph of each equation in the xy-plane for the given system?

A) $\left(\frac{r}{5}+7, -\frac{r}{5}+35\right)$

B) $\left(-\frac{3r}{2}+\frac{7}{2}, r\right)$

C) $\left(r, \frac{2r}{3}+\frac{7}{3}\right)$

D) $\left(r, -\frac{3r}{2}+\frac{7}{2}\right)$

if $y=r$, then $2x+3r=7$, $x=\frac{-3r+7}{2}$

if $x=r$, then $2r+3y=7$

$3y=-2r+7$

$y=\frac{-2r}{3}+\frac{7}{3}$

22

A window repair specialist charges \$220 for the first two hours of repair plus an hourly fee for each additional hour. The total cost for 5 hours of repair is \$400. Which function f gives the total cost, in dollars, for x hours of repair, where $x \geq 2$?

A) $f(x) = 60x + 100$

B) $f(x) = 60x + 220$

C) $f(x) = 80x$

D) $f(x) = 80x + 220$

(2, 220)

(5, 400)

Slope $= \frac{400-220}{5-2} = \frac{180}{3} = 60$

$m = 60$

$y - 220 = 60(x-2)$

$y - 220 = 60x - 120$

$y = 60x + 100$

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.

SAT Practice Test Worksheet: Answer Key

Mark each of your correct answers below, then add them up to get your raw score on each module. **As a reminder, use only the answer key for the second-stage module you chose to complete as part of your practice test, either module 2 (lower difficulty) or module 2 (higher difficulty).** Please note that the questions that appear in grayed-out rows below are unscored questions for research purposes. Do not consider these questions when calculating your raw scores. (Because of these unscored questions, the answer key has two more questions than the conversion tables.) Finally, add your scores from your two modules together to get your raw score for each section.

MATH

Module 1 (Routing)

QUESTION #	CORRECT	MARK YOUR CORRECT ANSWERS
1	C	
2	D	
3	C	
4	A	
5	D	
6	D	
7	77	
8	B	
9	D	
10	24	
11	D	
12	C	
13	D	
14	7	
15	27556	
16	25	
17	A	
18	D	
19	A	
20	D	
21	B	
22	D	

Module 2 (Lower Difficulty)

QUESTION #	CORRECT	MARK YOUR CORRECT ANSWERS
1	40	
2	C	
3	A	
4	C	
5	39000	
6	2	
7	B	
8	D	
9	B	
10	A	
11	A	
12	D	
13	D	
14	D	
15	41	
16	D	
17	A	
18	B	
19	B	
20	D	
21	11875	
22	C	

Module 2 (Higher Difficulty)

QUESTION #	CORRECT	MARK YOUR CORRECT ANSWERS
1	B	
2	B	
3	C	
4	B	
5	67	
6	B	
7	D	
8	A	
9	B	
10	36504	
11	3	
12	D	
13	C	
14	182	
15	A	
16	C	
17	B	
18	C	
19	C	
20	50	
21	B	
22	A	

MATH SECTION RAW SCORE
(Total # of Correct Answers)

	+		OR		=	
Module 1 (Routing)		Module 2 (Lower Difficulty)		Module 2 (Higher Difficulty)		