SAT Math Mock Test

SECTION 3

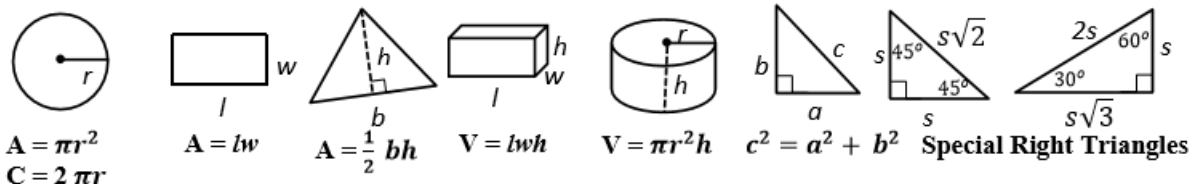**Math Test — NO Calculator**   **25 MINUTES, 20 QUESTIONS**

Directions:

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

Notes:

1. **No calculator** is allowed for this section. All numbers used are real numbers.
2. Figures that accompany problems in this test are intended to provide information useful in solving the problems. They are drawn as accurately as possible EXCEPT when it is stated in a specific problem that the figure is not drawn to scale. All figures lie in a plane unless otherwise indicated.
3. Unless otherwise specified, the domain of any function $f(x)$ assumed to be the set of all real numbers x for which $f(x)$ is a real number.

References:

$A = \pi r^2$ $A = lw$ $A = \frac{1}{2} bh$ $V = lwh$ $V = \pi r^2 h$ $c^2 = a^2 + b^2$ **Special Right Triangles**
$C = 2\pi r$

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 degree measures of the angles in a triangle is 180.

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1. The average (arithmetic mean) of 7, 14, and x is 16. What is the value of x?
   a) 25
   b) 26
   c) 27
   d) 28

2. If $2x + 1 = 9$, what is the value of $\sqrt{5x - 4}$?
   a) 4
   b) –4
   c) 3
   d) –3

3. The table below shows the number of cars sold by a certain brand of car dealerships for the first quarter of 2016 in five different locations. Based on the information in the table, what is the approximately probability of a car sold that is from the region II?
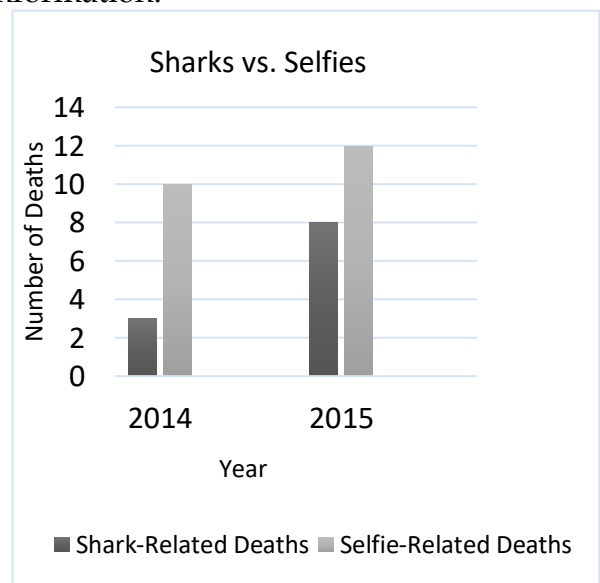
Number of Car Sold in 1st Quarter of 2016 in Five Locations

Location	Months		
	Jan.	Feb.	March
I	80	75	65
II	76	48	52
III	90	82	68
IV	52	68	72
V	64	62	60

a) 6.4%
b) 10.8%
c) 17.4%
d) 21.2 %

4. Let $wx^2 = y$, where $wxy \neq 0$. If both x and y are multiplied by 3, then w is

a) multiplied by $\frac{1}{3}$

b) multiplied by $\frac{1}{9}$

c) multiplied by $\frac{1}{18}$

d) multiplied by $\frac{1}{27}$

5. X is a set of numbers whose average (arithmetic mean) is 6. Y is a set that is created by tripling and subtracting 3 to each number in X. What is the average of the numbers in the set Y?

a) 10
b) 15
c) 16
d) 18

6. If $x^2 - 16 = 0$, which of the following could be a value of x?

a) –4
b) –8
c) 2
d) 8

7. If $y = x\sqrt{3}$ and $x \neq 0$, what does x^2 equal in terms of y?

a) $\frac{y^2}{3}$

b) $3y^2$

c) $\frac{9}{y^2}$

d) $\frac{y^2}{9}$

8. When $3x$ is added to 13 and the sum is divided by 5 subtracted from x, the result equals 4. What is the value of x?

a) 33
b) 29
c) 24
d) 18

Questions 9–10 refer to the following information:

Sharks vs. Selfies

Number of Deaths / Year

■ Shark-Related Deaths ■ Selfie-Related Deaths

News outlet *Reuters* reports that taking a selfie is actually a dangerous endeavor, and that many people have been injured

or died while taking a selfie. The figure above shows that more people around the world have died by taking selfies than by shark attacks in the years of 2014 and 2015. There have been twelve recorded selfie deaths in 2015 compared to eight people dying from shark attacks. The most common selfie-related deaths have been due to falling or being hit by a moving vehicle.

9. What is the percent change of total deaths (selfie-related and shark-related) from 2014 to 2015?
   a) 54%
   b) 70%
   c) 100%
   d) 233%

10. What is the difference between the percent changes of shark-related deaths and selfie-related deaths from 2014 to 2015?
   a) 20%
   b) 147%
   c) 167%
   d) 187%

2, 4, 6, 8

11. In the list above, if we add a positive integer P to the list, which of the following could be the median of the new list of five numbers?
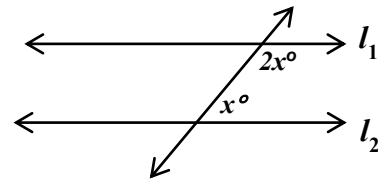   I. 4
   II.   5
   III.   6
   a) I only

b) I, II only
c) I, III only
d) I, II, III

12. If $3x + 1 = a$, then $6x + 1$?
   a) $a + 3$
   b) $a - 3$
   c) $2a - 1$
   d) $2a + 1$

Note: Figure not drawn to scale.

13. In the figure above, $l_1 \parallel l_2$, what is the value of x?
   a) 45
   b) 50
   c) 60
   d) 70

14. Let *m be defined as *$m = m^2 + 4$ for all values of m. If *$x = 3x^2$, which of the following could be the value of x?
   a) –2
   b) 1
   c) 2
   d) $-\sqrt{2}$

15. If $3x - 2 = 4$, then $3x + 4 =$?
   a) 10
   b) 11
   c) 12
   d) 14

Directions:

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

Answer: $\frac{7}{12}$

Write answer in the boxes. → | 7 | / | 1 | 2 |

← Fraction line
Decimal point →

Grid in results

Answer: 2.5

| 2 | . | 5 |

Answer: 201
Either position is correct.

| 2 | 0 | 1 | | 2 | 0 | 1 |

Note: You may start your answers in any column, space permitting. Columns not needed should be left blank.

- Mark no more than one circle in any column.
- Because the answer sheet will be machine-scored. **You will receive credit only if the circles are filled in correctly.**
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- No question has a negative answer.
- **Mixed numbers** such as $3\frac{1}{2}$ must be

gridded as 3.5 or $\frac{7}{2}$. (If [3|1|/|2] is gridded, it will be interpreted as $\frac{31}{2}$, not $3\frac{1}{2}$.)

- **Decimal Answer:** If you obtain a decimal answer with more digits than the grid can accommodate, it may be either rounded or truncated, but it must fill the entire grid. The acceptable ways to grid $\frac{2}{3}$ are:

| 2 | / | 3 | | . | 6 | 6 | 6 | | . | 6 | 6 | 7 |

16. The function $j@k = \left(\frac{j}{k}\right)^j$. If $j@k = -8$ when $j = -3$, what is the value of k?

17. A circle with center at coordinates (4, 3) touches the x-axis at only one point. What is the radius of the circle?
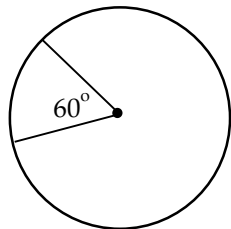
18. In the figure above, a piece with a 60° center angle has been cut out of an 18-ounce pie. How many ounces was the piece of pie that was cut out?
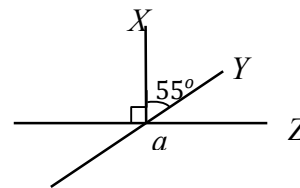
19. What is the value of a in the figure above?

20. Ms. DePietro provides some markers to her Arts class. If each student takes 3 markers, there will be 1 marker left. If 5 students take 4 markers each and the rest of students take 2 marker each, there will be no markers left. How many students are in Ms. DePietro's Arts class?
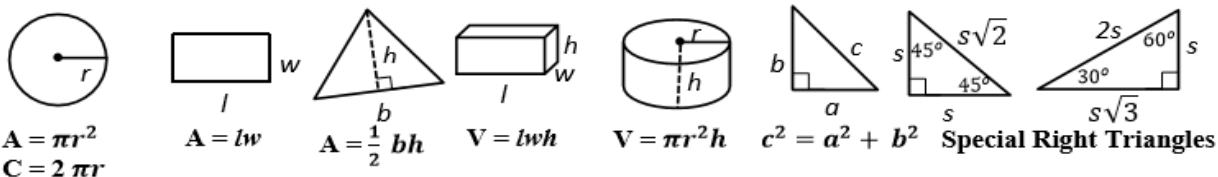
Directions:

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 31 on how to enter your answers in the grid. You may use any available space in your test booklet for scratch work.

Notes:

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References:

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

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1. The number of water lilies in a pond has doubled every five years since $t = 0$. This relation is given by $y = (x)2^{t/5}$, where t is in number of years, y is the number of water lilies in the pond at time t, and x is the original number of water lilies. If there were 800 water lilies in this pond 10 years after $t = 0$, then what was the original number of water lilies?
   a) 100
   b) 150
   c) 180
   d) 200

2. In the figure below, points A and B lie on circle O. If $\angle AOB = 2y°$, what is the value of x in term of y?

a) y
b) $90 - y$
c) $180 - y$
d) $90 - \frac{1}{2}y$

3. How many pounds of flour are needed to make 18 rolls of bread if 20 pounds of flour are needed to make 120 rolls of bread?
   a) 3
   b) 4
   c) 5
   d) 3.5
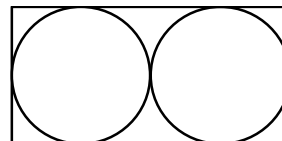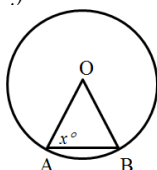
4. In the figure above, two congruent circles are inscribed in a rectangle. If the area of one circle is 4π, what is the area of the rectangle?

a) 24
b) 27
c) 32
d) 36

5. If $\frac{2}{5}$ of a number is 30, what is $\frac{1}{15}$ of that number?

    a) 3
    b) 4
    c) 5
    d) 6

6. Which of the following is the expression that represents the statement that the value of the cube of y multiplied by the value of the square root of z, all subtracted from five–sevenths of the square of x equals x?

    a) $\frac{5x^2}{7} - y^3\sqrt{z} = x$
    b) $\frac{5x^2}{7} - y^2\sqrt{z} = x$
    c) $\frac{5x^2}{7} - \sqrt{y^3 z} = x$
    d) $\frac{5}{7}x^2 - y^3 z^2 = x$

7. What would be the least amount of money needed to purchase exactly 31 tickets according the table below?

Bus Ticket Price	
Number of Bus Tickets	Price
1	7.5
Book of 6	40
Book of 12	75

    a) $207.5
    b) $202.5
    c) $200
    d) $197.5

1, 2, 3, 4 , 5, 6

8. A three-digit integer is to be formed from the digits listed above. If the first digit must be even, either the second or the third digit must be 5, and no digit may be repeated, how many such integers are possible?

a) 12
b) 15
c) 18
d) 24

9. The total population in all five cities increased by approximately what percent from 2012 to 2013?

Population in Five Cities
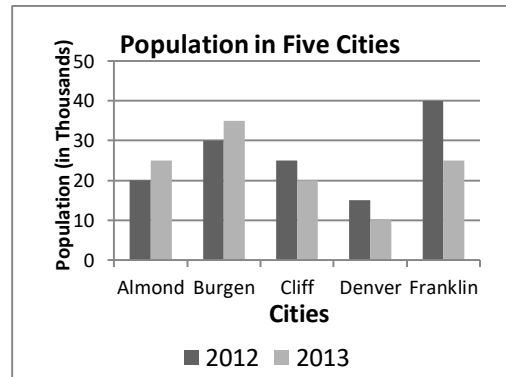
    a) 13.5%
    b) 11.5%
    c) −11.5%
    d) −13.5%

Questions 10 − 11 refer to the following information:

Density describes how compact or concentrated a material is. It is defined as the ratio between mass and volume, or mass per unit volume. The formula to calculate the density is:

$$Density = \frac{Mass}{Volume}$$

10. The standard gold bar held in gold reserves by central banks and traded among bullion dealers is the 400-troy-ounce (12,441.4-gram) Good Delivery gold bar. If the density of the gold bar is 19.3 grams per cm³, what would be the volume of the Good Delivery gold bar, in cm³?

    a) 592.8
    b) 644.6
    c) 696.4
    d) 748.2

11. If a cylinder gold block has a diameter of 4 centimeters and height of 15 centimeters, what would be its mass, in grams? (Gold has a density *of* 19.3 grams per cm³.)
    a) *3,638*
    b) *3,949*
    c) *9,100*
    d) *14,552*

	Course			
Gender	French	Spanish	Chinese	Total
Male	8	10	11	29
Female	12	14	15	41
Total	20	24	26	70

12. The table above represents the number of freshmen in Stoneville High School who currently enroll in three foreign language classes. Which of the following categories accounts for approximately 20 percent of all the students in those three foreign language classes?
    a) Males taking Chinese
    b) Females taking Spanish
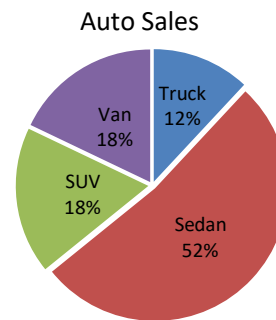   c) Males taking French
    d) Females taking Chinese

13. If $f(x + 1) = x^2 - 1$, then $f(x) = ?$
    a) $x^2 - 2x + 1$
    b) $x^2 + 2x + 1$
    c) $x^2 - 2x$
    d) $x^2 + 2x$

14. If John gives Sally $5, Sally will have twice the amount of money that John will have. Originally, there was a total of $45 between the two of them. How much money did John initially have?
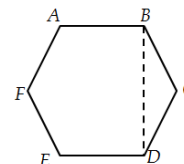   a) 25
    b) 20

c) 18
d) 15

Auto Sales

15. The pie graph above represents the automobiles that were sold by a dealer in 2010, according to their records. If the dealer sold 50 more Sedans than all others combined, how many automobiles did it sell altogether?
    a) 1,000
    b) 1,150
    c) 1,250
    d) 1,500

16. In the regular hexagon as shown above, if length of $\overline{AB}$ is 6, what is the length of $\overline{BD}$?
    a) 12
    b) 9
    c) $6\sqrt{3}$
    d) $6\sqrt{2}$

17. If set A = {1, 3, 8, 10, 15} and set B consists of all the even positive integers less than or equal to 10, how many elements are in the union of the two sets?
    a) 0
    b) 3
    c) 8

d) 9

18. If x and y are positive and $3x^2y^{-1} = 27x$, what is y^{-1} in term of x?

    a) $\frac{x}{9}$

    b) $\frac{9}{x}$

    c) $\frac{x^2}{9}$

    d) $\frac{x}{3}$

19. When r is divided by 12, the remainder is 9. What is the remainder when $r + 1$ is divided by 4?

    a) 0
    b) 1
    c) 2
    d) 3

20. Ken, Justin, and Tiff have read a total of 90 books from the library. Justin read 3 times as many books as Ken and Tiff read 2 times as many as Justin. How many books did Justin read?

    a) 9
    b) 18
    c) 27
    d) 36

21. How much money was originally in Sue's checking account if she withdrew m dollars, deposited n dollars, and now has l dollars in her checking account?

    a) $l + m - n$
    b) $l - m - n$
    c) $m + n - l$
    d) $m + n + l$

22. The number of DVDs that have been checked out of the local public library in a particular week was recorded in the table below. If the median number of DVDs checked out for the whole week was 83, which of the following could have been the number of DVDs checked out on Saturday and Sunday, respectively, of the same week?

Local Library Checkout Records	
Day of the Week	Number of DVDs Checked Out
Monday	77
Tuesday	81
Wednesday	82
Thursday	83
Friday	86

    a) 78 and 82
    b) 79 and 81
    c) 80 and 87
    d) 84 and 87

23. If $x > y > 0.1$, which of the following is less than $\frac{x}{y}$?

    a) $\frac{x+0.1}{y+0.1}$

    b) $\frac{2x}{2y}$

    c) $\frac{x-0.1}{y-0.1}$

    d) $(\frac{x}{y})^2$

Weights of New Born Babies (in ounces)							
96	95	98	101	110	100	91	88
112	70	89	97	99	101	105	112
130	132	101	97	160	101	100	105

24. The table above lists the weight, to the nearest ounce of a random sample of 24 new born babies. The outliers of 160 and 70 ounces are errors. Of the mean, median, and range of the values listed, which will NOT change if those two outliers are removed from the data?

    (a) Median
    (b) Range
    (c) Standard deviation
    (d) Mean

25. If no wallpaper is wasted, how many square feet of wall paper is needed to cover a rectangular wall that is 6 yards by 8 yards (1 yard = 3 feet)?

a) 432 square feet
b) 384 square feet
b) 378 square feet
d) 324 square feet

26. The monthly cost of renting an apartment increases every year by 3%. John paid $500 per month this year on his rental. What is the monthly cost for John's rental n years from now?
   a) 500×0.03^n
   b) $500 \times 1.03 \times n$
   c) 500×1.03^n
   d) $500 \times 1.03^{n-1}$

27. July 4th, 2014 is a Friday. What day of the week is July 4th, 2050?
   a) Sunday
   b) Monday
   c) Thursday
   d) Friday

28. In a sequence of numbers, the leading term is 2. Each successive term is formed by adding 1 to its preceding term and then multiplying the result by 2. What is the fourth term in the sequence?
   a) 30
   b) 32
   c) 42
   d) 46

29. If the fraction $\frac{1}{7}$ equals the repeating decimal 0.1428571428571.., what is the 303rd digit after the decimal point of the repeating decimal?
   a) 1
   b) 4

c) 2
d) 8

30. The graph of $h(x)$ is a line. If $h(-2) = 7$ and $h(4) = 3$, then an equation of $h(x)$ is
   a) $\frac{2}{3}x - \frac{17}{3}$
   b) $-\frac{2}{3}x + \frac{17}{3}$
   c) $\frac{2}{3}x + \frac{17}{3}$
   d) $-\frac{3}{2}x + \frac{17}{3}$

Directions:

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

Answer: $\frac{7}{12}$

Write answer in the boxes. →

← Fraction line
Decimal point →

Grid in results

Answer: 2.5

Answer: 201
Either position is correct.

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31. In a junior high school with seventh and eighth graders, there is the same number of girls as boys. The eighth grade has 220 students, and there are 5 boys for every 6 girls. In the seventh grade there are 5 boys for every 4 girls. How many girls are in the seventh grade?

32. The length of a rectangular piece of cardboard is 15 inches longer than its width. If a 5-inch square is cut from each corner of the cardboard, and the remaining piece is folded up to form a box, the volume of the box is 1,250 cubic inches. Find the sum of the length and the width, in inches, of the original cardboard.

33. If the average (arithmetic mean) of 35, 50, 20, and x is 40, then find the value of x.

34. If the sum of all consecutive integers from -41 to x, inclusive, is 42, what is the value of x?

35. Gina drove at an average of 40 miles per hour from her house to a bookstore. Along the same route, she returned at an average of 60 miles per hour. If the entire trip took her 1 hour, how many miles did Gina drive in total?

36. In a poll, 20 people supported the current city mayor, 20 people were against him, and 10 people had no opinion. What fraction of those polled supported the city mayor?

37. What is the value of $|\frac{3+i}{i-3}|$? (Round your answer to the nearest tenth.)
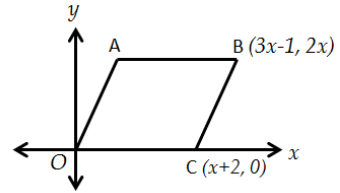
38. In the figure above, if the area of parallelogram OABC is 16, what is the value of x?