Test 1

SAT Math Test

--No Calculator Section--

1. Solve the equation $3x - 9 = 8 - (x + 3)$.

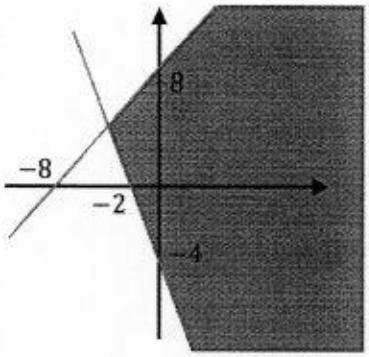
2. If $\frac{4}{5}x + \frac{2}{3}y = 2$, what is the value of $12x + 10y$?

3. If $\begin{cases} y < x + 4 \\ y > -x - 1 \end{cases}$,

which point is NOT in the solution set?

A) (0,3)
B) (2,2)
C)(−1,4)
D)(7,5)

4.



Which of the following inequalities describes the lines depicted in the graph?

A) $\begin{cases} y \geq -2x - 4 \\ y \leq x + 8 \end{cases}$

B) $\begin{cases} y \geq 2x - 8 \\ y \leq -x + 4 \end{cases}$

C) $\begin{cases} y \geq -x + 4 \\ y \leq 2x - 8 \end{cases}$

D) $\begin{cases} y \geq x + 8 \\ y \leq 2x - 4 \end{cases}$

5. Cindy earns a wage of $4.50 per hour at her waitress job. She also receives multiple tips that are an average of $2 each. She is expected to give 50% of her tips to the busser that cleans her tables. If x is the number of tips she receives in one hour, which of the following equations represents how much she earns in one hour?

A) $2x + 4.5$
B) $1.5(2x) + 4.5$
C) $5.5x$
D) $0.5(2x) + 4.5$

6. A water park varies the amount of chemicals they throw into their pools, but sticks to a ratio of 10 gallons of bleach to 1 gallon of alkaline. When they mass-order from the store, bleach costs \$5 per gallon and alkaline costs \$12 per gallon. Which of the following systems could be used to solve for the gallons of bleach and alkaline bought, if the total amount of money spent was \$1444.60?

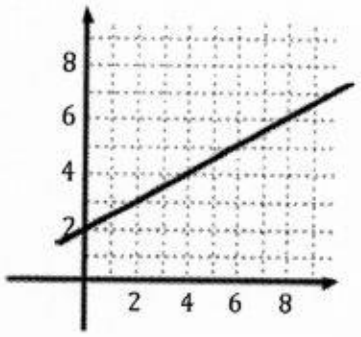
A) $\begin{cases} a + b = 10 \\ 5b \times 12a = 1444.6 \end{cases}$

B) $\begin{cases} a + b = 10 \\ 5b + 12a = 1444.6 \end{cases}$

C) $\begin{cases} a = 0.1b \\ 5b \times 12a = 1444.6 \end{cases}$

D) $\begin{cases} a = 0.1b \\ 5b + 12a = 1444.6 \end{cases}$

7.



Which of the following equations describes the line depicted in the graph, if the line was shifted five units to the right?

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

B) $y = \frac{1}{2}x + 7$

C) $y = \frac{1}{2}(x - 5) + 2$

D) $y = \frac{1}{2}(x + 5) + 2$

8. If $9 < 4x + 5 < 17$, what is the possible natural number of x?

9. If $2x^2 + 5x = 12$ and $x < 0$, what is the value of $x + 5$?

10. Given the function $f(x) = x^2 + 5x - 14$, which of the following must be true?

I. $f(x)$ has a root at $x = 7$
II. $(x - 2)$ is a factor of $f(x)$
III. $f(x)$has two real roots

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

11. Which of the following is an equivalent form of $\frac{\sqrt{72x^3}}{3\sqrt{x}} + 4x^{6/3}$?

A) $\frac{2x+\sqrt{x}}{\sqrt{x}}$

B) $\frac{\sqrt{72x}}{3} + 4x^3$

C) $2x + \sqrt{x}$

D) $2x(2x + \sqrt{2})$

12. Which of the following is an equivalent form of $(x - 2)^2 - 9$?

A) $(x - 3)(2x + 3)$
B) $(x - 5)(x + 1)$
C) $(x - 5)(x + 5)$
D) $(x - 5)(x - 1)$

13. Given the function, $f(x) = 2x^2 + 12x - 14$, which of the following would be the best form to find the roots of the function?

A) $f(x) = 2x(x + 6) - 14$
B) $f(x) = 2(x + 3)^2 - 32$
C) $f(x) = 2(x^2 + 6x - 7)$
D) $f(x) = (2x - 2)(x + 7)$

14. Which of the following is an equivalent form of $3x^2y(4 + y^3) - x(2xy^4 + 2y - 7xy)$?

A) $5x^2y^4 + 5x^2y + 2xy$
B) $x^2y^4 + 5x^2y + 2xy$
C) $x^2y^4 + 19x^2y - 2xy$
D) $5x^2y^4 + 19x^2y - 2xy$

15. The expression $\frac{3x^2-14x-5}{2x^3-9x^2-5x}$ can be rewritten as which of the following?

A) $\frac{3x+1}{2x^2+x}$
B) $\frac{x-5}{2x^2+x}$
C) $\frac{3x-19}{2x^2-9x-5}$
D) $\frac{3x^2-14x-5}{2x^2-9x-5}$

16. Elvis and Justin have been given an order for a custom wooden dog house. Elvis is still an apprentice carpenter and takes three times as long as Justin to build a custom dog house. If the equation below represents their combined effort to build the dog house, what does y represent?

$$\frac{1}{E} + \frac{3}{E} = \frac{1}{y}$$

A) The portion of the job that Elvis can complete in one hour.
B) The portion of the job that Justin can complete in one hour.
C) The time it takes both, Elvis and Justin, to build the dog house.
D) The time it takes for Elvis to build the dog house by himself.

17. If $\frac{3x+2a}{3a+2} = 3y - x$, a is equal to:

A) $\frac{3y-x}{3x+2}$
B) $\frac{6y-5x}{3x-9y+2}$
C) $\frac{5y-6x}{2x-9y}$
D) $\frac{6y-2x}{3x-9y+2}$

18. Sean's company makes cylindrical roller skate wheels and is trying to determine whether a new polyurethane formula is cheaper than the existing formula. The wheels Sean's company makes have a hollow core with an inner radius of 1 cm, an outer radius of 6 cm, and a width of 4 cm. If it currently costs Sean 20 cents to make a single wheel, what is the most the new formula can cost, in cents per cubic centimeter, and still be cheaper than the existing formula?

A) 0.02
B) 0.03
C) 0.04
D) 0.05

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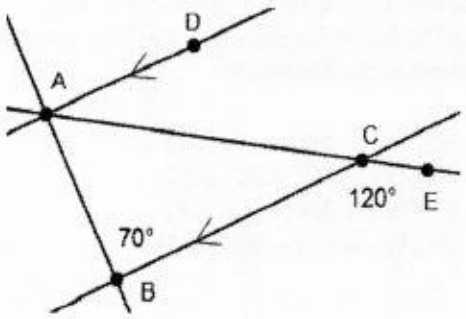
19. If $\tan a = -1$ and $|\cos a| = \cos a$, determine the value of a.

A) $\frac{\pi}{4}$
B) $\frac{3\pi}{4}$
C) $\frac{5\pi}{4}$
D) $\frac{7\pi}{4}$

20.



[Note: Figure not drawn to scale]

In the figure above, if $AD \| BC$, $m\angle BCE = 120$, and $m\angle ABC = 70$, determine $m\angle BAC$.

SAT Math Test

--Calculator Section--

1. Solve $\frac{x+2}{3} - \frac{2x-1}{5} = \frac{x+5}{2}$.

A) $-\frac{23}{13}$
B) $-\frac{35}{17}$
C) $-\frac{49}{17}$
D) $-\frac{61}{13}$

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2. If $\frac{b}{a} = 3$, what is the value of $\frac{a^2+ab+b^2}{a^2-2ab-b^2}$?

A) $\frac{5}{12}$
B) $\frac{3}{5}$
C) $-\frac{7}{11}$
D) $-\frac{13}{14}$

3. $\begin{cases} 25 = 18x - ay \\ 2 = 86x - 6y \end{cases}$

If the system of equations above intersect at $x = 1$, which of the following is a solution for a?

A) -2
B) $-\frac{7}{4}$
C) $-\frac{1}{2}$
D) $\frac{1}{2}$

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4. $\begin{cases} 2x + ay = 18 \\ 5x - 3y = b \end{cases}$

When $(x, y) = (3,2)$, what is the product ab?

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5. If $\frac{13}{3} < 5t + 2 < \frac{22}{5}$, what is one possible value of $-t - 1$?

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6. Which of the following is equivalent to

$$24 \leq 5\left(\frac{1}{2}\right)(t) + \frac{3}{2}t?$$

A) $t \geq \frac{3}{2}$
B) $t \leq 3$
C) $t \geq 6$
D) $t \leq 6$

7. If $3(9y) = 6(11y) - 78$, then what is the value of y?

8. $\begin{cases} 7a - 23b = 11 \\ -23 + 14a = 46b \end{cases}$

Given the system of equations above, how many solutions can be found?

A) No solutions
B) 1
C) 2
D) Infinitely many solutions

9. $\begin{cases} y = 25t + 12 \\ 10y = 10t + 24 \end{cases}$

Given the system of equations above, which of the following is a solution?

A) $(\frac{2}{5}, 2)$
B) $(-\frac{2}{5}, 2)$
C) $(\frac{4}{5}, 32)$
D) There are no solutions or infinitely many solutions.

10. A delivery truck carries boxes of tiles from stores to customers. The delivery service charges a few dollars per box, and a flat fee of $27 for the trip. Ryan orders 5 boxes of tiles and is charged $42. Which of the following linear models represents the cost of the delivery service?

A) $c = 2b + 5$
B) $c = 2b + 27$
C) $c = 3b + 27$
D) $c = 5b + 32$

11. Find the y-intercept of $\frac{7}{4}x - \frac{12}{5}y = \frac{7}{3}$.

A) $(0, -\frac{35}{36})$
B) $(0, \frac{35}{36})$
C) $(0, \frac{5}{6})$
D) $(0, 1)$

12. $\begin{cases} 2x - y = y + 4 \\ x + 3y = 10 \end{cases}$

Based on the system of equations above, what is the value of x + y?

13. A large tank preserves a family's emergency supply of water during a drought, but a leak causes the water to flow out at a constant rate. After 3 days of the tank being filled, 181.5 liters remains in the tank. 28 days after the tank was filled, 144 liters are left. Which of the following equations represents the amount of water in the tank?

A) $y + 3x = 186$
B) $2y + 3x = 372$
C) $2y + 3x = -372$
D) $2y - 3x = 372$

14. A jar of purple and yellow jelly beans is sitting in the lobby of a daycare. The parents are encouraged to enter a raffle where if they guess the correct percentage of yellow jelly beans in the jar they could win a free month of tuition. A daycare worker is pretty sure that the percentage is 25% yellow (or 1 out of every 4 jelly beans is yellow). She overheard other employees talking about the contest and they are all in agreement that the ratio is 1 to 3, or 33% yellow. Not having time to count thousands of jelly beans, the worker decides to sample the jelly beans to test this percentage. Below is her sampling.

# of jelly beans sampled	# of yellow jellybeans	Percentage of yellow in sample
5	1	20%
20	5	25%
40	13	32.5%
55	17	30.9%
65	21	32.3%
75	24	32%
85	27	31.8%

Which statement about her choice of data collection is most accurate?

A) The worker should have counted all of the jelly beans because random sampling will not give her an accurate measure.
B) The worker should have sampled the exact same number of jelly beans each time in order to decrease sample variability, resulting in more accurate percentages.
C) The worker should have continued with small samples each time, increasing the accuracy of the sampling percentage.
D) The worker should have continued with larger samples each time, increasing the accuracy of the sampling percentage.

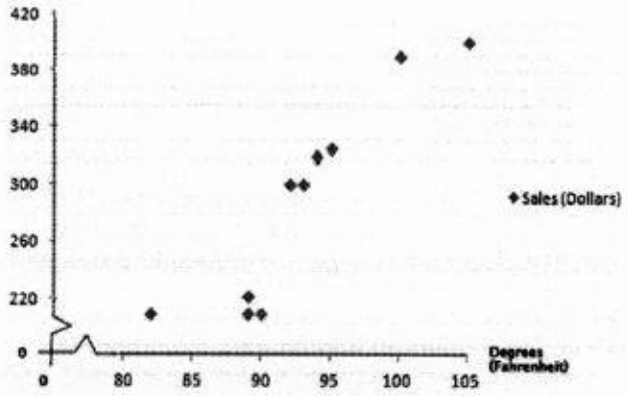
15. Jonathan reduced the size of a photo to a width of 4 inches. What is the new height if it was originally 32.9 inches tall and 7 inches wide? Round to the nearest tenth if necessary.

A) 57.6 inches
B) 29.9 inches
C) 18.8 inches
D) 11.0 inches

16. For every American dollar, Laos has a currency exchange of 8,044.50 Kips. When Joan visited Laos, she exchanged $1415 into Kips but was charged a 2 % exchange fee. After her exchange, what was her total in Kips?

A) 11,155,308.15 Kips
B) 227,659.35 Kips
C) 11,382,967.50 Kips
D) 2,276,593.50 Kips

Ice cream sales (in dollars) and the temperature outside (in degrees Fahrenheit) are compared and graphed. Use this graph for questions 17-19.



17. Based on the scatterplot data, which statement most closely represents the relationship of the variables?

A) There is no correlation between ice cream sales and the temperature.
B) There is a positive correlation between the temperature outside and the sales of ice cream.
C) There is negative correlation between ice cream sales and the temperature outside.
D) There is not enough evidence in the graph to interpret the correlation.

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18. What would be the approximate number of sales (in dollars) when the temperature is 97.5 degrees Fahrenheit?

A) 400
B) 300
C) 350
D) 325

19. Which equation would be the most approximate line of best fit for this scatterplot?

A) $y = -10x + 684$
B) $y = 10x + 684$
C) $y = -10x - 684$
D) $y = 10x - 684$

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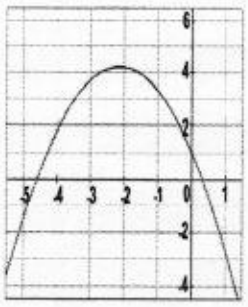
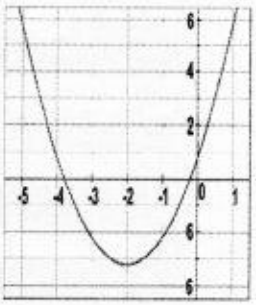
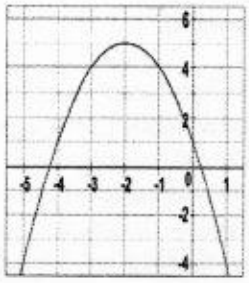
20. Which of the following graphs represent the function $f(x) = -x^2 - 4x + 1$?

A) 

B) 

C) 

D) None

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21. A hardware store normally sells nails in bulk at \$1.19 a pound. There is a sale of 3 pounds of nails for \$2.29. How much can be saved by purchasing 9 pounds of nails at the sale price?

A) \$1.10
B) \$3.84
C) \$6.87
D) \$9.90

22. A local pet grooming salon gives the employees two choices of payment for washing dogs:

    1. Two dollars for *each* dog washed,
    2. Two cents for the first dog washed, four cents for washing 2 dogs, eight cents for washing 3 dogs, and so on, with the amount doubling for each additional dog washed.

    How many dogs would an employee have to wash before method 2 pays more than method 1?

    A) Method 2 will never pay more than method 1.
    B) Method 2 pays the same amount as method 1.
    C) Method 2 will pay more after 10 dogs.
    D) Method 2 will pay more after 12 dogs.

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23. At Brookstown High School, 56% of the students play a sport and 41% of the students play a sport and are part of a club. What is the probability that a student is in a club given that he/she plays a sport?

    A) 137%
    B) 97%
    C) 73%
    D) 15%

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24. A local company offers health insurance and dental insurance to its employees. 45% of employees have both kinds of insurance, and 10% have only dental insurance. If 15% of the employees have no insurance, what percentage of employees have health insurance?

    A) 30%
    B) 45%
    C) 55%
    D) 75%

A group of men and women were asked what kind of vehicle they drove, a car or a truck. This data was inserted into the two-way frequency table below. Use this table to answer questions 25-26.

	CAR	TRUCK	Totals
Men	21	39	60
Women	135	45	180
Totals	156	84	240

25. What percentage of men asked drive a truck?

    A) 65%
    B) 35%
    C) 46%
    D) 16%

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26. Based on the chart, if 300 women were asked whether they drive a car or a truck, how many can we predict would say they drive a car?

    A) 135
    B) 225
    C) 195
    D) 168

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27. Test scores for a class of 20 students are as follows:

    93, 84, 97, 98, 100, 78, 86, 100, 85, 92, 72, 55, 91, 90, 75, 94, 83, 60, 81, 95

    What is the median test score?

    A) 88
    B) 45
    C) 100
    D) 82

28. $\begin{cases} x^2 - 3y = -2 \\ 2x - y = 1 \end{cases}$

If (x, y) is a solution for the system of equations above, what is a solution for x^2?

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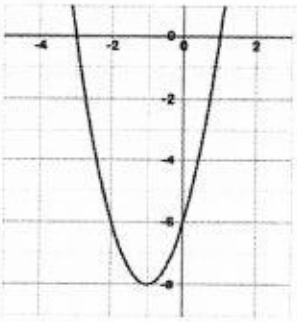
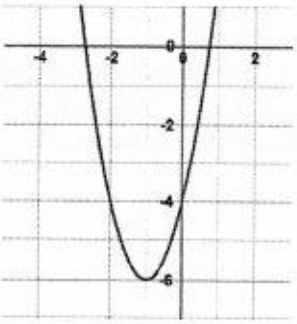
29. Which of the following graphs represents the equation $f(x) = 2x^2 + 4x - 6$?

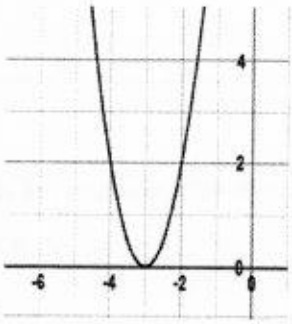
A)



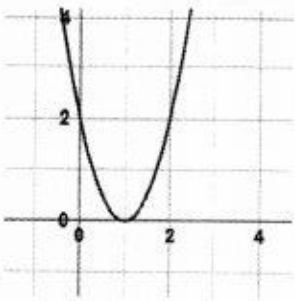
B)



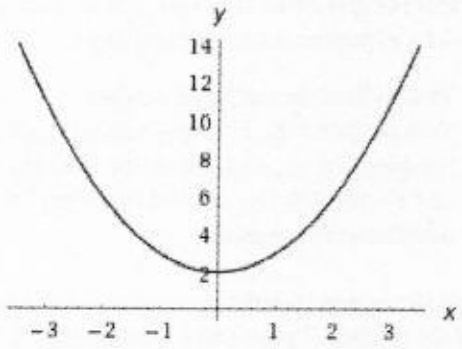
C)



D)



30.



The above graph corresponds to the function $f(x) = x^2 + 2$. Determine the vertex of the graph for $f(x - 2)$.

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

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31. Given the equation, $9x^2 - 8x = 2(2 - 4x)$, which of the following is a solution for x?

A) $x = 0$
B) $x = \frac{1}{2}$
C) $x = \frac{2}{3}$
D) $x = 1$

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32. Which of the following are the solutions to the equation $\frac{1}{x+2} - \frac{2x}{3-x} = 0$?

A) $x = -2, x = 3$
B) $x = -1, x = 0$
C) $x = -3, x = -\frac{1}{2}$
D) $x = -3, x = \frac{1}{2}$

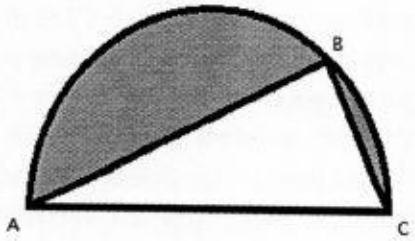
33. What is one possible solution to the equation $\frac{x-4}{x-5} = \frac{2}{x+1}$?

A) 3
B) 4
C) 5
D) 6

34. $\begin{cases} y = x^2 - 7 \\ y = -3x - 3 \end{cases} \quad (x > 0)$

If (x, y) is a solution to the above system of equations, what is a possible value of $3x + 2$?

35.

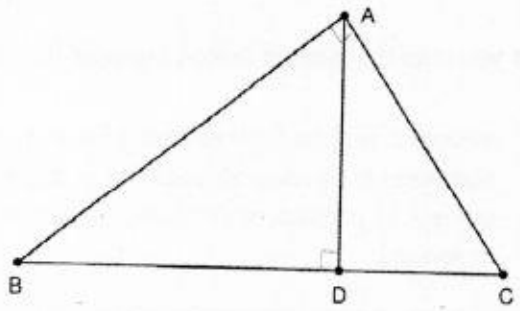


[Note: Figure not drawn to scale]

In the figure above, $\angle ABC$ is an angle inscribed inside a semi-circle with a radius of 4.
If $BC = \sqrt{3}\,AB$, determine the area of the shaded region.

A) 16π
B) 8π
C) $8\pi - \frac{8\sqrt{3}}{3}$
D) $8\pi - 8\sqrt{3}$

36.



In the figure above, ΔABC is a right triangle with altitude AD. If $DC = 3$ and $AD = 4$, determine the measure of AB.

37. Which of the following is equivalent to the expression, $i^3 - (2i^2 + i)^2$?

A) $3i - 3$
B) $3i + 5$
C) $5i - 3$
D) $5i + 5$

38. Steve can mow 1 football field every 1:10. Assuming there are 1.3 acres in a football field, approximately how many acres can he mow in 20 hours?

A) 20 acres
B) 23 acres
C) 25 acres
D) 27 acres

Test 2

SAT Math Test

---No Calculator Section---

1. For the inequality

   $4 - 10x > 8 - x > 2 - 10x$, which of the following could be a value of x?

   A) $-\frac{5}{19}$
   B) $-\frac{5}{9}$
   C) $\frac{11}{19}$
   D) $-\frac{11}{19}$

2. A troublesome child breaks three out of eight toys when he's playing. At the beginning of the day he has 70 toys. In one hour he plays with 12 toys. Which of the following functions of time (t) models the number of toys he has throughout the day?

   A) $f(t) = -\frac{3}{8}t + 70$
   B) $f(t) = -12t + 70$
   C) $f(t) = -\frac{9}{2}t + 70$
   D) $f(t) = 70t$

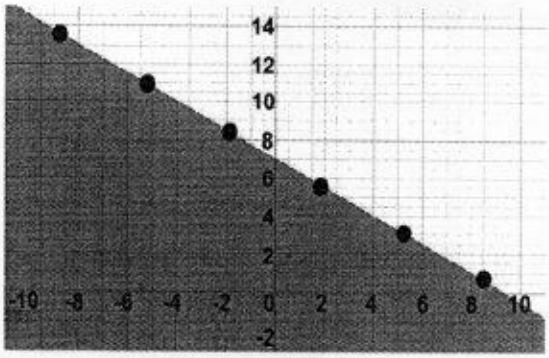
3. A school storeroom contains writing utensils that must be shipped according to weight. One pen weighs 6 grams and one pencil weighs 5 grams. If all the pens and pencils together weigh 27.252 kilograms, which equation models the weight of the writing utensils?

   A) $6x + 5y = 27.252$
   B) $6x + 5y = 27252$
   C) $30xy = 27.252$
   D) $11x = 27252$

4. $\begin{cases} y > kx - 2 \\ y \geq x - k \end{cases}$

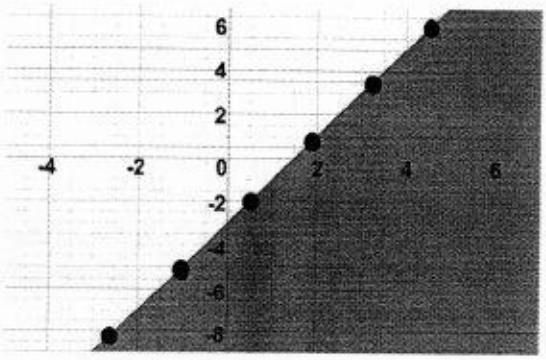
   What value of k, where $k > 0$, would allow the coordinate (3,4) to be in the solution set?

5. Given the graphed linear inequality, find a value of k so that the inequality $y < -kx + 7$ would include the graphed solution set.

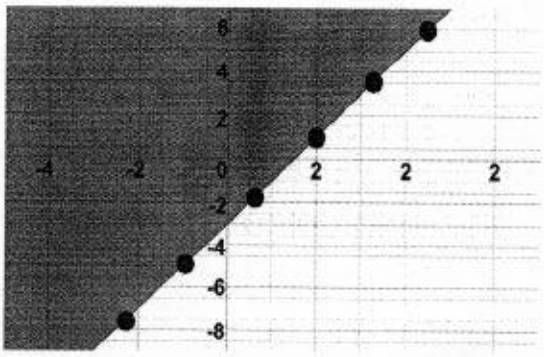


6. Graph the inequality $2x - 3 \geq y$.

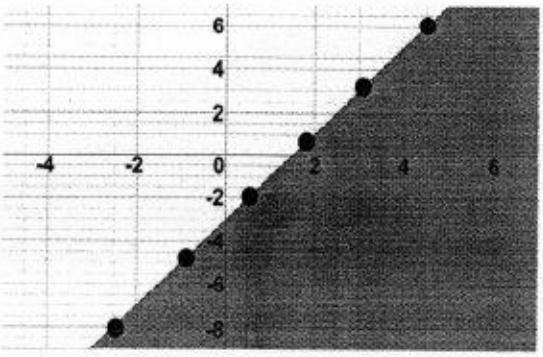
A)



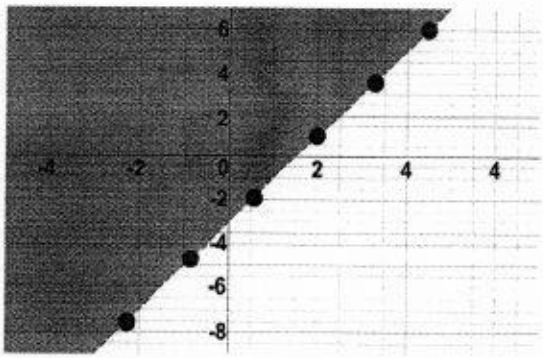
B)



C)



D)

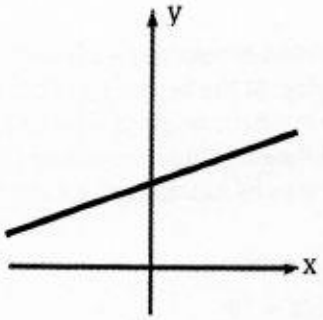


7. Three ounces of water leak out of a cracked pot for every minute it is carried. One day, a Sumerian travels to a creek, fills the pot with 42 ounces of clean water, and then travels back to his home. Giving his family 10 ounces, he then travels to his neighbors. What function of t, the total time he travels, represents how much water he takes to his neighbors?

A) $w(t) = 42 - t$
B) $w(t) = 42 - 3t$
C) $w(t) = 52 + 3t$
D) $w(t) = 32 - 3t$

---

8. Which of the following equations could be represented by the graph:



A) $15x - 21y = -42$
B) $-4x + \frac{1}{9}y = -12$
C) $23x + 10y = 143$
D) $3x - 7y = 13$

---

9. Which of the following forms of the function $f(x)$ is best suited for finding vertical asymptotes?

A) $f(x) = \frac{2}{x^2-2x-3}$
B) $f(x) = \frac{2}{(x-1)^2-4}$
C) $f(x) = \frac{2}{(x+1)(x-3)}$
D) $f(x) = (x^2 - 2x - 3)^{-1}$

10. Which of the following is equivalent to $\frac{\sqrt{(x^2-2)^2-4}}{x\sqrt{x-2}}$?

A) $\frac{\sqrt{x-4}}{\sqrt{x-2}}$

B) $\frac{\sqrt{x+6}}{\sqrt{x-2}}$

C) $\frac{\sqrt{x-6}}{\sqrt{x-2}}$

D) $\sqrt{x+2}$

11. Which of the following is equivalent to $\frac{x^2-2}{x+\sqrt{2}}$?

A) $x-\sqrt{2}$
B) $x+\sqrt{2}$
C) $x-2$
D) $x+2$

12. Which of the following is a simplified form of $3xy(x^2y+2x)-6y(x^2-4xy)$?

A) $27x^3y^2$
B) $12x^2y-21xy^2$
C) $3x^3y^2+12x^2y+24xy^2$
D) $3x^3y^2+24xy^2$

13. Which of the following is equivalent to $\frac{\frac{X^2-X-2}{X+3}}{\frac{X^2-3X-4}{X^2+X-6}}$?

A) $\frac{1}{x-4}$

B) $\frac{x-2}{x+2}$

C) $\frac{(x-2)^2}{x-4}$

D) $\frac{(x+1)^2(x-4)}{(x+3)^2}$

14. Steve came up with the equation $A=5000r^t$ to determine the amount of money he can earn from a fixed interest savings account with rate p, such that $0<p<1$. If his initial deposit was \$5000 dollars and he wants to find out how much money is in the account after two years, which of the following must be true?

A) $0<r<1$
B) $r=p$
C) $r>1$
D) Cannot be determined from the provided information.

15. $\begin{cases} y=(x-3)^2-1 \\ y=x^3-2x^2-16x+32 \end{cases}$

How many common roots do the above equations have if $\frac{x^3-2x^2-16x+32}{x-2}=x^2-16$?

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

16. If both $f(x)$ and $f^{-1}(x)$ are functions, $f(4) = 2, f(0) = 4$, and $g(x) = x^2 + 2$, what is $g(f^{-1}(4))$?

17. Given the equation $\frac{ax}{3y} + 2xy = 4ay$, solve for x.

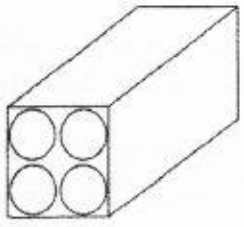
A) $\frac{12ay^2}{a+2y}$

B) $\frac{12ay^2}{a+6y}$

C) $\frac{12ay^2}{a+6y^2}$

D) $\frac{12ay^2}{3a+6y^2}$

18. A manufacturer is making wooden dowels from rectangular prisms of wood. The dowels are cut in the manner depicted below. Determine the amount of wood that is unused from each block if the block has dimensions of 5 cm x 5 cm x 20 cm, and the dowels each have a 2 cm radius.



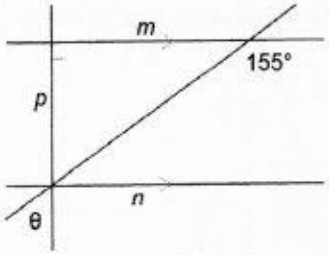
A) 320π cm^3
B) 500 cm^3
C) $500 - 80\pi$ cm^3
D) $500 - 320\pi$ cm^3

19. Simplify the following expression.

$$(i^3 + i^2)(i - i^3)$$

A) $2 - i$
B) $-2 + i$
C) $2 - 2i$
D) $2i^3$

20.



In the figure above, lines m and n are parallel, while line p is perpendicular to line m. Determine the value of θ.

SAT Math Test

---Calculator Section---

1. Simplify the expression $\frac{12(4x+1)}{-9}+\frac{5x-2}{4}$.

A) $\frac{103x+29}{9}$
B) $\frac{-103x-29}{9}$
C) $\frac{79x+10}{12}$
D) $\frac{-49x-22}{12}$

---

2. Solve the equation $4x = 36\left(\frac{1+x}{2}+\frac{2}{3}\right)+8$.

A) $x=-\frac{21}{7}$
B) $x=-\frac{25}{7}$
C) $x=\frac{51}{14}$
D) $x=\frac{25}{2}$

---

3. Which of the following is equivalent to the inequality $4\left(\frac{a}{9}+7-\frac{a}{4}\right)+\frac{1}{2}\leq\frac{179}{6}-a$?

A) $a\leq 3$
B) $a\geq 3$
C) $a\leq 4$
D) $a\geq\frac{3}{4}$

---

4. Find a solution coordinate (p,q) to the equation $29p-8q=27$, where q is three times greater than p.

A) $(\frac{17}{7},\frac{38}{7})$
B) $(\frac{81}{5},\frac{27}{5})$
C) $(\frac{27}{5},\frac{81}{5})$
D) $(\frac{9}{7},\frac{9}{7})$

---

5. $$\begin{cases} 3y-14=-12x \\ 3(y+3x+27)=5 \end{cases}$$

Solve the system of equations above to find the value of x.

---

6. $$\begin{cases} \frac{y}{3}=(x+10) \\ 7x+3y=22 \end{cases}$$

Solve the above system.

A) (3,12)
B) $(-\frac{1}{4},\frac{9}{4})$
C) $(-\frac{17}{2},\frac{69}{2})$
D) $(-\frac{17}{4},\frac{69}{4})$

---

7. Solve the following equation.

$$25b+\frac{3(16-b)}{5}=16+2b$$

A) $b=2$
B) $b=\frac{2}{7}$
C) $b=\frac{3}{4}$
D) No solution

8. Solve the following equation.

$$\frac{36x-(1-3x)}{18} = \frac{(2+x)}{6} - \frac{7}{18} + 2x$$

A) $x = 0$
B) $x = \frac{1}{3}$
C) No solution
D) All real numbers

---

9. If $27x + 20 + \frac{(x+1)}{2} = 22$, then what is the value of x?

---

10. $$\begin{cases} y = 32x + 20 \\ \frac{x}{4} + 4y = \frac{1}{5} \end{cases}$$

Solve the above system of equations.

A) (0,0)
B) $(-\frac{32}{55}, \frac{76}{55})$
C) $(-\frac{28}{45}, \frac{4}{45})$
D) (−3,2)

---

11. $$\begin{cases} 30x + c = 42y \\ 16x - c = 23y + 14 \end{cases}$$

Given that $(-\frac{87}{2}, -31)$ is a solution of the above system of equations, what is the value of c?

12. The ticket booth for a carnival charges 8 dollars for adults and 5 dollars for children. The carnival is only open for a week and the cost to keep it open is $2500. Since the owner of the carnival wants to make a profit of at least $2000 to be happy, if they sell 308 adult tickets and 397 children tickets, will the owner be happy?

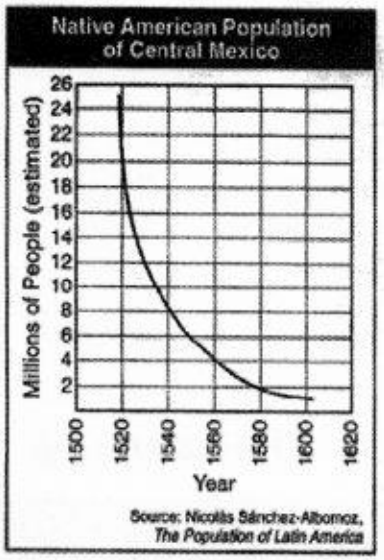
A) The owner will lose more than he makes.
B) The owner will make a profit but not be happy.
C) The owner will make a profit of over $2000 and be happy.
D) Not enough information is given.

---

13. A painter can cover 12 square feet of wall in one hour. He uses a gallon of paint to cover 200 square feet. The painter did 10 hours of work on Wednesday to finish a job, but the painter has used 4 gallons of paint for the whole job. How many square feet had he already painted before that Wednesday?

A) 120 $sq.ft.$
B) 400 $sq.ft.$
C) 680 $sq.ft.$
D) 800 $sq.ft.$

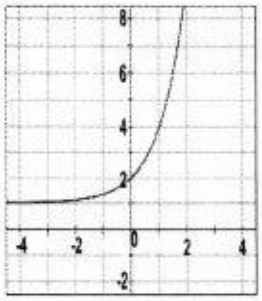
14. Using the data below, which statement about the population between 1520 and 1580 is correct?



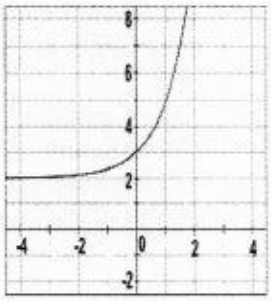
A) The population decreased by approximately 18 million people.
B) The population decreased by approximately 24 million people.
C) The population decreased by half each year.
D) The population decreased by 2 million people each year.

15. The growth of a population of bacteria that triples each hour is represented by the function $f(x) = 3^x$. Which graph shows the population's growth?

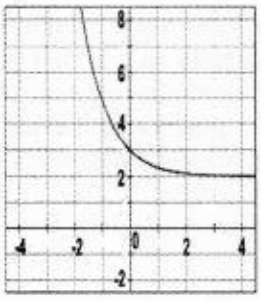
A)



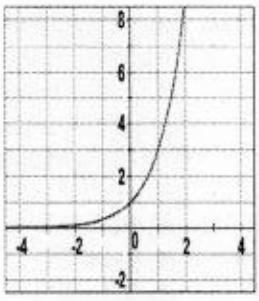
B)



C)



D)



16. Tracy is building a bed for his dog that is similar to his own bed, but with each dimension a third of the size. Tracy's bed has a headboard $5\frac{1}{2}$ feet wide. How many inches wide will the headboard of the dog's bed need to be?

A) 1.83 inches
B) 22 inches
C) 26 inches
D) 66 inches

17. Alex is running for class president against one other candidate. Before the election, she wants to figure out if she will win. She knows she does not have time to ask the entire school, so she asks 57 people in the hallway. 24 people answer that they will be voting for her. If there are 495 students in her school, how many people can she expect to vote for her in the actual election?

A) 24 students
B) 167 students
C) 208 students
D) 1176 students

---

18. Competing local grocery stores are running sales on apples. Store 1 has apples on sale for 3 lb. for $5. Store 2 is selling their apples in 7-pound bags for $11.69. Store 3 sells apples at a price of $9.00 for 6 lb. Which store is running the best deal?

A) Store 1
B) Store 2
C) Store 3
D) All three stores sell apples for the same price.

---

19. Jenny bought a sweater at the mall at 20% off the original price. She also bought a pair of socks for $3.20. After paying a sales tax of 7%, her total was $29.06. Approximately how much did the sweater originally cost?

A) $20
B) $30
C) $60
D) $120

20. James is trying to interpret a map. His destination on the map is two and a half inches away. He determines that this distance is equivalent to 375 miles. How many miles are equivalent to half an inch on the map?

A) 62.5 miles
B) 75 miles
C) 150 miles
D) 750 miles

21.

Fast Eddie's Fast Food

Title	Salary (per year)	Number of Employees
Owner/president	$250,000	1
Regional manager	$65,000	5
Store manager	$40,000	22
Server/cashier	$27,420	134
Fry cook	$16,988	92
Cleaning crew member	$14,997	65

When analyzing the above chart of salaries, which central tendency would be a good representation of the salaries at Fast Eddie's Fast Food? Why?

A) The mean is an average of all the salaries, therefore it would be the best representation.
B) The mean can be skewed by outliers, therefore the median salary would be the best representation.
C) The median is influenced by outliers so the mode would be the best representation.
D) The range gives a good view of all the salaries, therefore it would be the best representation.

22. A class lottery is held at the end of each month for students who have turned in a whole week's worth of homework. Jacob, Laura, Stephen, Billy, Jennifer, and Sarah were the only students to get their names put in the lottery. Jacob finished three weeks of homework, so his name went into the lottery three times. Laura and Billy both completed two weeks of homework. Jennifer and Sarah completed all four weeks. Stephen only completed one week of homework. Based on this data, what is the probability that a girl's name will be pulled?

23. If it takes 6 painters 10 hours to paint a house, how many painters will it take to paint the house in 5 hours?

24. Jamal started a new job at $200 a week. By the fourth week, Jamal was making $300 a week. By what percentage did Jamal's income change from his first week of work to his fourth?

A) 25%
B) 50%
C) 75%
D) 100%

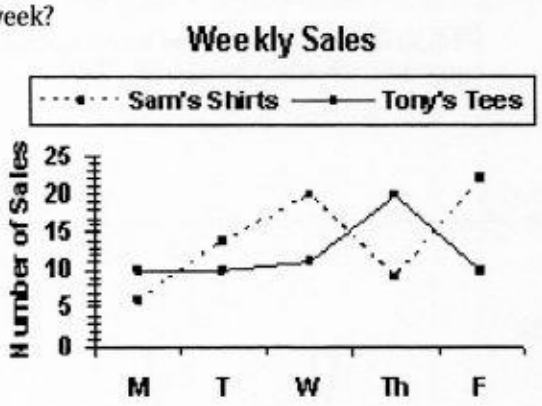
25. Your broken washing machine will cost you $100 to repair. It will cost you $300 to buy a new one. The new washer is an energy-efficient machine, which will save you $10 per month on your water bill compared to your old washing machine. How many months will it take for the new machine to save you the difference in repairing versus buying new?

A) 10 months
B) 20 months
C) 30 months
D) 40 months

26. The total cost of six equally priced energy drinks is $15.00. If the cost per energy drink is decreased by $0.50, how much will ten energy drinks cost at the new price?

A) $20.00
B) $25.00
C) $30.00
D) $35.00

27. According to the graph above, between which two days did both stores have an increase in sales this week?



A) Wednesday to Thursday
B) Monday to Tuesday
C) Thursday to Friday
D) Tuesday to Wednesday

28. What is one possible solution to the equation $\frac{3}{6-x} - \frac{3}{x} = 0$?

29. Given $\frac{1}{6}x^2 + 4x - 72 = 0$, find $\frac{1}{2}x$ when $x > 0$.

30. If $\frac{2}{x}+\frac{3}{x+2}=1$, which of the following is equal to $x+2$?

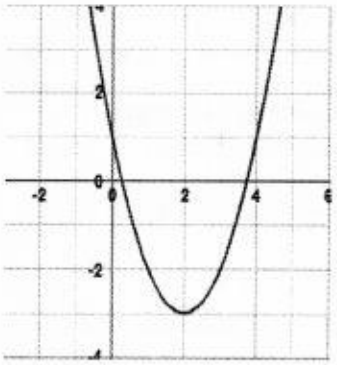
A) 6
B) -2
C) 0
D) 3

---

31. $\begin{cases} y = x^2 + 4x + 5 \\ y = \frac{1}{3}(x+5) \end{cases}$

If (x, y) is the solution to the above system of equations, what is the value of $-2xy$?

32.



Select the equation that represents the graph above.

A) $y = x^2 - 3$
B) $y = x^2 + 2x - 3$
C) $y = x^2 - 4x + 1$
D) $y = x^2 + 4x + 1$

33. $\begin{cases} y^2 + x^2 = 4 \\ y = x \end{cases}$

If (x, y) is a solution to the system of equations above, determine the value of $\frac{x^2}{y^2}$.

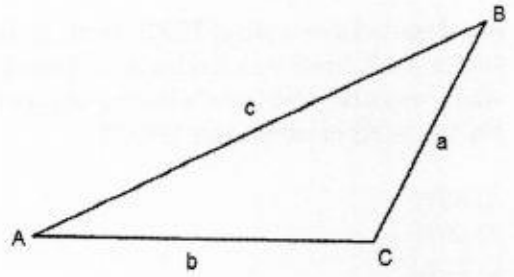
A) 0
B) 1
C) 4
D) Cannot be determined.

---

34. If $f(x) = x^2 + 6x + 5$, determine the location of the vertex for $|f(x)|$.

A) $(-3, -4)$
B) $(-3,4)$
C) $(3, -4)$
D) $(3,4)$

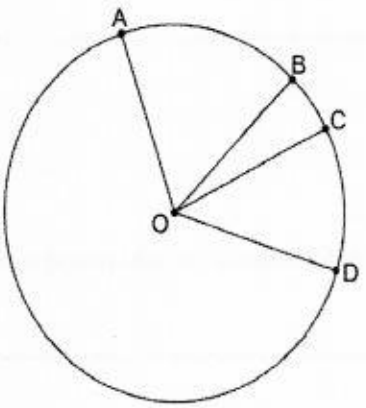
35.



In the figure above, m∠A = 25°, m∠B = 30°, and $b = 3$. Find c.

A) $\frac{3 \sin 125}{\sin 30}$
B) $\frac{3 \sin 30}{\sin 125}$
C) $\frac{\sin 125}{3 \sin 30}$
D) $\frac{\sin 30}{3 \sin 125}$

36.



[Figure not drawn to scale.]

In the figure above, $m\angle AOC = 40°$, $m\angle AOD = 110°$, and the circle has a radius of 5. Determine the measure of the minor arc $\overset{\frown}{BC}$, in radiance, if $m\angle BOC = \frac{1}{2}(m\angle AOD - m\angle AOC)$.

A) $\frac{10\pi}{9}$

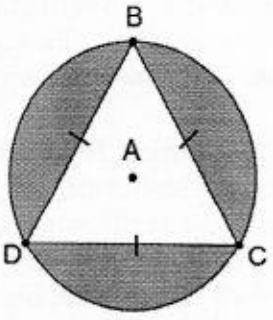
B) $\frac{35\pi}{36}$

C) $\frac{35\pi}{18}$

D) $\frac{55\pi}{18}$

---

37. Determine the area of the shaded region in the figure below, if the radius of the circle centered at A is 3.



A) $9\pi - 3\sqrt{3}$

B) $9\pi - \frac{27\sqrt{3}}{4}$

C) $9\pi - 6\sqrt{3}$

D) $9\pi - \frac{27\sqrt{3}}{2}$

38. Susan earns a base salary of \$95/week plus 7% commission on her sales. If she earned \$525 last week, approximately how much did she sell?

A) \$6150
B) \$6250
C) \$6350
D) \$6450

Test 3

SAT Math Test

—No Calculator Section—

1. Twelve plus two times a variable is the same as the variable multiplied by four. What is the variable?

2. A bus picks up x passengers at the first stop. At the second stop, twice as many people get on, while six passengers get off. Four couples get off at the third stop, while one family of five gets on. A dozen passengers remain and leave the bus at the final stop. How many people got on at the first stop?

3. There are y carnations on sale at the flower shop each day. If $y \square \frac{k-1}{2}$ is an inequality euqation, where k is the constant number of carnations being bought, what must the inequality in the box be in order for carnations to always be on sale? Assume k is greater than zero.

   A) $>$
   B) $<$
   C) $\geq$
   D) $\leq$

4. The following table shows how many minutes it takes Joanne to wash some dishes. Find the rate at which she washes dishes, in the number of dishes per minute.

Dishes	Minutes
9	1.5
12	2
15	2.5
21	3.5

5. Solve $6(1-x) > 2(2x-6)$ for x.

   A) $x > 3$
   B) $x < 5$
   C) All real numbers
   D) No solution

6. Given $3y + 37 = a(y + 18) + y + 1$, find the value of a that will allow the equation to be true for any value of y.

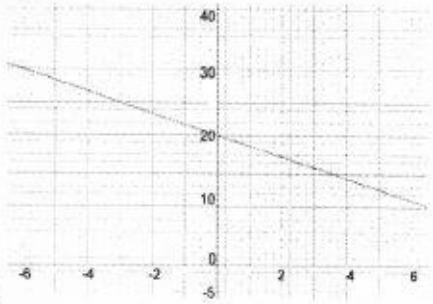
7. $$\begin{cases} y = ax + b \\ y = cx + d \end{cases}$$

   Solve the system of equations above, and solve for x. Assume the constants a, b, c, d are all not equal to zero.

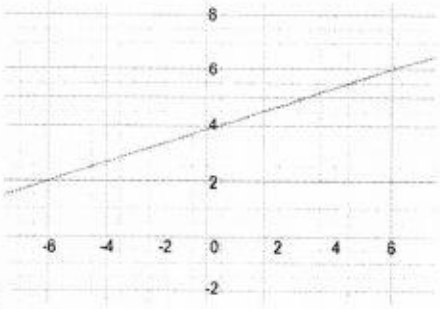
   A) $\frac{b}{c}$
   B) $\frac{b+d}{c-a}$
   C) $\frac{b-d}{c-a}$
   D) $\frac{b+d}{c+a}$

8. Which of the following graphs is the graph of $\frac{1}{3}x + \frac{1}{5}y = 4$?

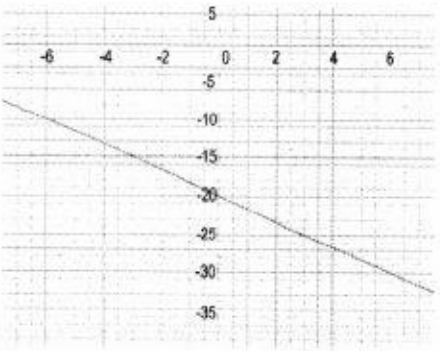
A)



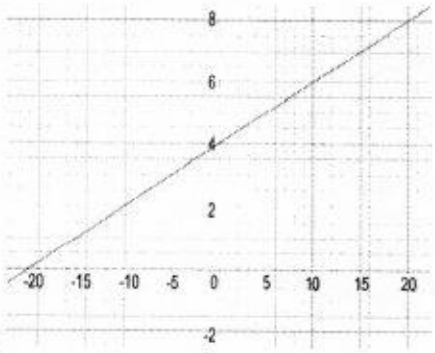
B)



C)



D)



9. Which of the following is the equation for a parabola with roots at(2,0)and $(-3,0)$?

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

10. Which of the following is equivalent to $\frac{\sqrt{x^3}-\sqrt{x}}{\sqrt{x^5}-\sqrt{x}}$?

A) $\frac{x}{x+1}$
B) $\frac{1}{x+1}$
C) $\frac{1}{x-1}$
D) $\frac{1}{x}$

11. If x and y are the two solutions to the equation $b(b-4) = 2b - 5$, what is the value of $2x + y$ when $x > y$?

12. Simplify the following expression:

$$2b(ab + 3b) + 5ab^2 - 4b^2 + 6(3b^2 - 4ab^2)$$

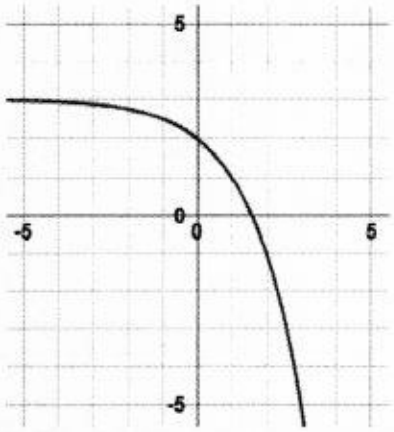
A) $20b^2 - 17ab^2$
B) $11b^2 - 2ab^2$
C) $20b^2 + 31ab^2$
D) $11b^2 + 17ab^2$

13. Jill is starting her own quilt making business and uses an equation, $P(b)$, to determine her profits for each quilt. Jill's quilts are square shaped and made up of square blocks for which she charges customers \$5 per block. If the equation below represents her profits from any given quilt with b blocks, which part of the equation represents her expenses?

$$P(b) = 5b^2 - b$$

A) $P(b)$
B) 5
C) b^2
D) $-b$

14. If the graph below represents the function $g(x)$, which equation is the best estimate of $g(x)$?



A) $g(x) = 2^x$
B) $g(x) = -2^x$
C) $g(x) = -2^x - 1$
D) $g(x) = 3 - 2^x$

---

15. Two functions are defined as $h(x) = 3x - 2x^2$ and $g(x) = h(x + 2)$. If $h(x)$ has a vertex of (a, b) and $g(x)$ has a vertex of (c, d), determine $(a + c, b - d)$.

A) (2,0)
B) $(\frac{7}{2}, \frac{9}{2})$
C) $(-1, \frac{9}{4})$
D) $(-\frac{1}{2}, 0)$

---

16. If $\frac{2a^2+2ab+4bx}{x} = \frac{6ax-2a}{x} + 4b$, determine $2(a + b)$.

A) $3x - 1$
B) $6x - 2$
C) $\frac{6x}{x}$
D) $\frac{6x+4bx}{x}$

17. $f(x), g(x)$, and $h(x)$ are all quadratic equations, with five roots between the three equations. If $\frac{g(x)}{f(x)} = \frac{x+3}{x+4}$ and $\frac{f(x)}{h(x)} = \frac{x+2}{x+5}$, determine the vertex of the function $f(x)$.

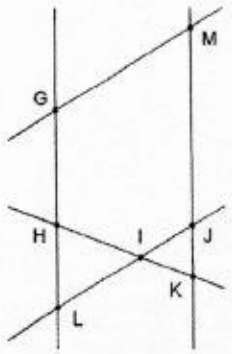
A) (4,2)
B) (2, −1)
C) (−3,2)
D) (−3, −1)

---

18. Simplify $\frac{(3i)^2+i(i^3-i)}{i}$.

A) $-9i$
B) $-7i$
C) $7i$
D) $9i$

19.



In the image above, the lines $GH \| MK$ and $GM \| LJ$. Which of the following statements must be true?

I. m∠G = m∠L
II. m∠JIK ≠ m∠IHL
III. m∠J = m∠G

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

---

20. The equation $x(x + 2) + 1 = 6y - y^2$ is the equation of a circle. Determine the center of the circle and its radius.

A) $(-1,3), r = 3$
B) $(-2,6), r = 9$
C) $(1, -3), r = 3$
D) $(-2,6), r = 9$

SAT Math Test

---Calculator Section---

1. What value of q will make the following expression equal to 27?

$$(17 + 9 \times 12)^{\frac{1}{3}}\left(q + \frac{1}{2}\right) + 8q - 34$$

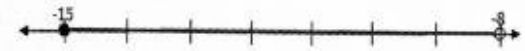
A) $\frac{9}{2}$
B) $\frac{5}{6}$
C) $\frac{11}{2}$
D) $\frac{7}{3}$

2. For the inequality equation $3z + 19 \leq -5 < 2(z + 20) + z$, which of the following represent the possible values of z on a number line?

A) 

B) 

C) 

D) 

3. The force needed to compress a spring is related to the distance it is compressed from its natural length. If a spring is compressed 23 mm by a force of 30 pounds, then how many millimeters would the spring be compressed by a force of 34.5 pounds?

A) 20
B) 23.8
C) 26.45
D) 45

4. A function describing the number of shoes made in a factory depending on the number of people working takes the form $f(x) = \frac{a}{b}x + c$. If $a = 1$, and the productivity with *zero* people is zero, then what value of b would allow 12 people working to make 54 shoes?

5. Choose an inequality that would not affect the solution of the following system.

$$\begin{cases} 36r + 16t > 1 \\ 25r - 35t < 7 \end{cases}$$

A) $t > 0$
B) $9r > -4t + 2$
C) $r < 2$
D) $7t > 5r - 49$

6. Find the value of w for which there is no solution to the following system.

$$\begin{cases} 2y > y + wx + 2 \\ 3(8 + x) - 5y > 3^3 - 2y \end{cases}$$

7. Jim is trying to lose weight, but he insists on continuing his midday and evening diet. He will only change the number of eggs he eats for breakfast and how many minutes he goes running. However, for every hour he runs, he can't help but eat an extra egg that day. His doctor says that at 2000 calories per week he will maintain his current weight. He decides to eat two eggs a day, not counting spontaneous eating caused by running. If he burns 16 calories per minute, consumes 450 calories for lunch and 630 calories for dinner, and one egg is 91 calories, about how many minutes must he run in order to maintain his weight?

A) 60
B) 67.5
C) 78.9
D) 84.5

8. The heat a fire emits increases 12 joules per pine log that is placed in the fire. A maple log, on the other hand, increases the heat by 15 joules. The fire loses a constant 7 joules per hour through the chimney. Jack uses three times as many pine logs as maple logs. If the total heat emitted over the hour is 248 joules, find how many fewer maple logs Jack used than pine logs.

9. Solve $13\left(\frac{v}{2}-1\right)=2(6v-23)$ for v.

10. If $f(x)=14x+18$ and $f(x)=-3(\frac{7}{h}x-6)$, find h so that there are infinitely many solutions.

A) $\frac{2}{3}$
B) $\frac{3}{2}$
C) $-\frac{3}{2}$
D) Not enough information given.

11. Lisa can sew together 24 dresses in 7 hours using her old sewing machine. A new sewing machine she bought allows her to sew 52 dresses in the same amount of time. If she asks her brother to help her by using the old machine while she uses the new one, how many dresses could they sew in 10 hours?

12. A popular band sold 74% of their tickets to teens and the rest to adults. Each teen increased the band's Billboard ranking by 2, whereas the adults only increased their ranking by 0.5 per person. If their ranking went up by 222, how many tickets did the band sell?

13. Find the equation of the line that describes the shortest distance between $(34,-12)$ and $(-38,-20)$.

A) $y=8x-284$
B) $y=\frac{1}{9}x-\frac{142}{9}$
C) $y=x-142$
D) $y=9x-318$

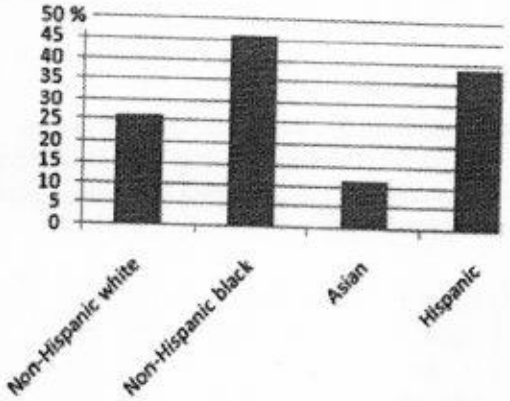
The Centers for Disease Control and Prevention published a study discussing obesity trends in the United States. The percentage of obesity for ages 20-39 is shown by race. Use the data below to answer questions 14-16.

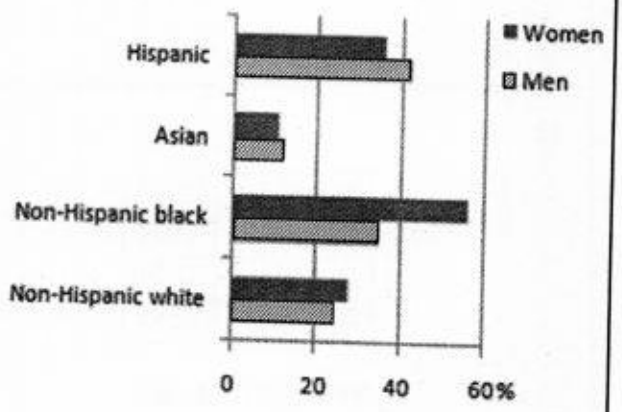
Obesity Trends

A study by the Centers for Disease Control and Prevention shows that obesity continues to be a concern in the United States.

For ages 20-39

Obesity (BMI = 30)





14. When comparing ethnicities, which group is at the highest risk of obesity?

A) Non-Hispanic white
B) Non-Hispanic black
C) Non-Hispanic Asian
D) Hispanic

15. In which ethnicity is there the biggest gap between the percentage of obese men and obese women?

A) Non-Hispanic white
B) Non-Hispanic black
C) Non-Hispanic Asian
D) Hispanic

16. Based on the data, if 250 white women aged 20 to 39 had their BMI measured, how many of them would have a BMI of 30 or more?

A) 28 women
B) 60 women
C) 70 women
D) 120 women

17. A rectangular piece of material measures 7cm by 6 cm by 14 cm. It has a mass of 710.0 grams. What is the density of the piece, rounded to the nearest hundredth?

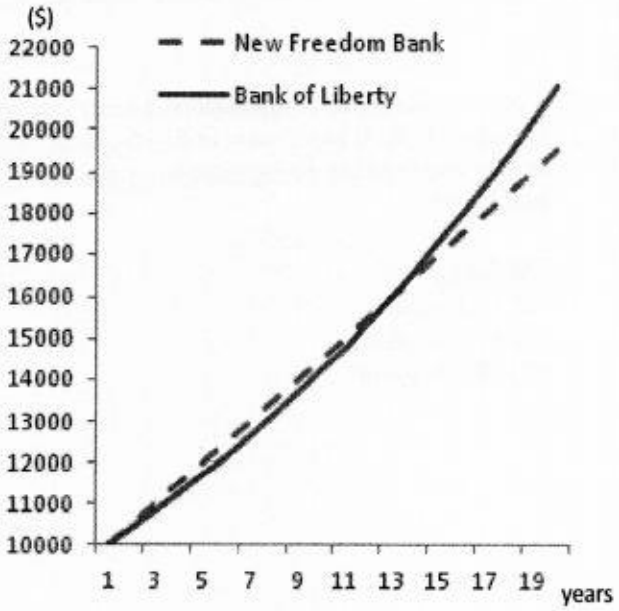
A) 0.83 g/cm^3
B) 1.21 g/cm^3
C) 122.00 g/cm^3
D) 588.00 g/cm^3

18. Water has a density of 1.00 g/mL. If a ball with a volume of 250 mL and a mass of 125 g was thrown into a pool, would the ball float?

A) Yes, because its density is 0.5 g/mL, which is less than the density of water.
B) Yes, because its density is 2.0 g/mL, which is more than the density of water.
C) No, because its density is 0.5 g/mL, which is less than the density of water.
D) No, because its density is2.0 g/mL, which is more than the density of water.

---

19. Hope for Children Charity wants to invest $10,000. New Freedom Bank is offering a 5% simple interest yearly. Bank of Liberty pays 4% interest compounded annually. The following curves represent how much the investment would accumulate at each bank.



How many years would it take for Bank of Liberty to earn a higher investment for the charity?

A) 1 year
B) 3 years
C) 11 years
D) 13 years

20. The arithmetic mean of a set of five numbers is 19. If four of the numbers in the set are 5, 14, 26, and 33, what is the missing number?

A) 15
B) 16
C) 17
D) 19

---

21. The population of a town is 5000 people. It is predicted that the population will grow by 2.5% annually. What is the projected population of the town in five years?

A) 5,520
B) 5,657
C) 15,259
D) 488,282

22.

Downloads	Cost
Single Song	$1.29
Full Album	$7.99
Game	$2.55

Monthly Downloads

	Single Song	Full Album	Game
Charles	13	3	5
Taylor	11	2	7

The average monthly downloads of two teens are shown above. Based on the tables, what is the total amount the teens spend on music during an average month?

A) $30.96
B) $53.49
C) $70.91
D) $101.51

23. The bill for dinner with your friends is $27.44. Your friends all calculate their own totals and tell you that you owe $7.43 plus tip. You leave a tip of a dollar and two quarters. What is the approximate percentage of your own bill that you left as a tip for the server?

A) 6%
B) 10%
C) 11%
D) 20%

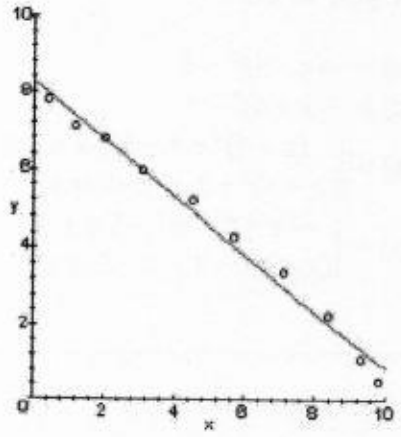
24. There is a bag containing 25 pieces of candy. You have a 1/5 chance of grabbing a chocolate bar from the bag. How many chocolate bars are in the bag?

A) 5
B) 10
C) 15
D) 20

25. 60% of your friends play a musical instrument and 35% play a musical instrument and play a sport. What percent of those who play a musical instrument also play a sport? Round your answer to the nearest percent.

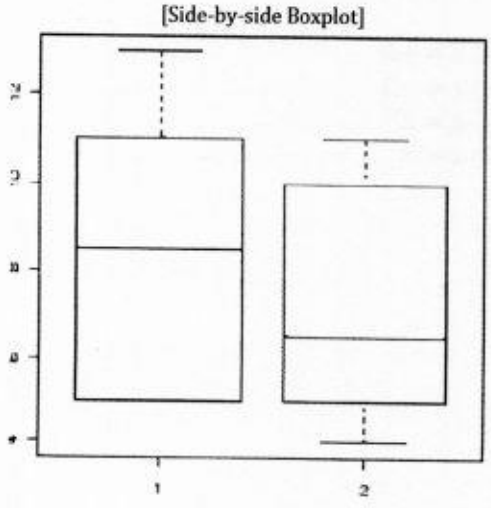
A) 25%
B) 40%
C) 42%
D) 58%

26. What is the best estimate of the correlation coefficient of the scatterplot below?



A) 0
B)1
C) -1
D)undefined

27. According to the side-by-side box plots below, what is the difference in ranges between two sets of data?



28. A function is defined as $f(x) = (x+4)^2 - 1$. Which of the following equations best represents $g(x)$ if $g(x) = |f(x)|$?

A) $g(x) = -(x+4)^2 - 1$
B) $g(x) = -(x+4)^2 + 1$
C) $g(x) = \begin{cases} (x+4)^2 + 1, -5 \le x \le -3 \\ (x+4)^2 + 1, x < -5 \text{ or } x > -3 \end{cases}$
D) $g(x) = \begin{cases} -(x+4)^2 + 1, -5 \le x \le -3 \\ (x+4)^2 - 1, x < -5 \text{ or } x > -3 \end{cases}$

29. Which of the following is equivalent to $a^3 + 8$?

A) $(a-8)(a^2+8a+64)$
B) $(a+8)(a^2-8a+64)$
C) $(a+2)(a^2+2a+4)$
D) $(a+2)(a^2-2a+4)$

30. For the equation $\frac{x^3-9x+5x^2-45}{x-2} = 0$, which of the following is not a solution?

A) $x = -5$
B) $x = -3$
C) $x = 2$
D) $x = 3$

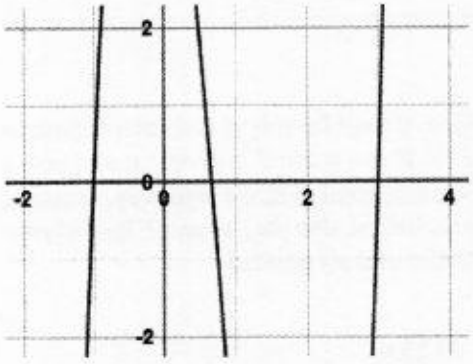
31. $\begin{cases} y = 2x - 4 \\ y = x^2 - 3x \end{cases}$

If (x, y) is a solution to the above system of equations, which of the following is a possible value for xy?

A) 2
B) 6
C) 8
D) 16

32. If $\frac{5}{x^2+x-6} = \frac{1}{x-2} - \frac{A}{x+3}$, determine the value of A.

33. Given the graph of $f(x)$ below, which of the following expressions would be a factor of $f(x)$?



A) $x - 2$
B) $x - 1$
C) $x + 1$
D) $x + 2$

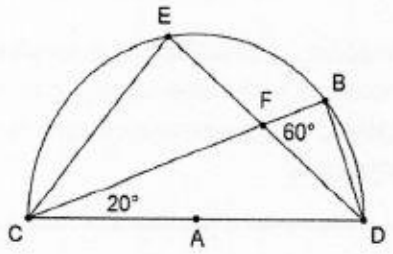
34. The function f is defined as $f(x) = (x + a)^2 - b$. If $f(x)$ has roots at $x = -3$ and $x = -1$, which of the following are potential values of a and b?

A) $a = 2, b = -1$
B) $a = 2, b = 1$
C) $a = 3, b = 1$
D) $a = -1, b = -3$

35. A cylindrical drinking glass has an outer radius of 4 cm and an inner radius of 3.75 cm. The glass is 12 cm tall, but the bottom 1 cm of the glass is solid. If the glass has a density of 2.6 g/cm^3, which of the following is the best estimate of the mass of the glass?

A) 20 g
B) 120 g
C) 300 g
D) 500 g

36. In the diagram below, m∠BFD = 60°, m∠BCD = 20°, and $CD = 10$. Determine the length of the line CE.



A) 3.4
B) 6.4
C) 7.7
D) 10

37. A minor arc is created by a central angle with a measure of θ radians. If $\sin(\theta + \frac{\pi}{3}) = -\frac{1}{2}$, determine the measure of θ.

A) $\frac{\pi}{6}$
B) $\frac{\pi}{3}$
C) $\frac{2\pi}{3}$
D) $\frac{5\pi}{6}$

38. A giraffe can reach maximum speeds of 35 miles per hour. Approximately how many feet per second can a giraffe run?

A) 30 ft/sec
B)35 ft/sec
C) 45 ft/sec
D) 50 ft//sec

Test 4

SAT Math Test

—No Calculator Section—

1. If a variable plus 16 is equivalent to triple the variable, what's the value of the variable?

2. At dawn there were x ducks in a pond. Over the course of the morning, five more ducks come to the pond, and at noon, half of the ducks fly away, leaving a total of 15. How many ducks were in the pond at dawn?

3. Jeremy and Mark go to the same gym. Every day, Mark does 15 minutes of calisthenics, 5 minutes of jumping jacks, and runs for half an hour. If Jeremy wants to spend more time exercising than Mark, which inequality best describes how many minutes he must spend exercising any given day?

   A) $t > 50$

   B) $t \geq 50$

   C) $t > 350$

   D) $t > \frac{5}{6}$

4. Whenever Natalie goes out for dinner, she spends however much her dinner costs, plus a 15% tip. If she also takes the subway both ways, and the subway costs $2.50 for a ride, which function best represents how much she spends on a night where she gets a meal that costs x?

   A) $f(x) = 0.15x + 2.5$
   B) $f(x) = 0.15x + 5$
   C) $f(x) = 1.15x + 2.5$
   D) $f(x) = 1.15x + 5$

5. Solve $-3(2x + 3) = 5(2x - 5)$ for x.

6. Given $ay + 8 = 8(a - 2) + 3y$, find the value of a that will allow the equation to be true for any value of y.

7. $$\begin{cases} y = \frac{3x}{2} + 6 \\ x - \frac{ay}{3} = -4 \end{cases}$$

   What must the value of the constant a be if the above system has infinitely many solutions?

8. If a linear graph has a y-intercept of -5 and a slope of $\frac{1}{3}$, which of the following is the equation of this graph?

   A) $x - 3y = 15$
   B) $x - 3y = -15$
   C) $3x - y = 15$
   D) $3x - y = -15$

9. Which of the following is an equation for a parabolic function that has a root at $x = 2$ and contains the point $(-1, -18)$?

   A) $y = x^2 - 2$
   B) $y = (x - 2)(x + 1)$
   C) $y = x^2 + 5x - 14$
   D) $y = x^2 + 9x - 9$

10. Which of the following forms is best suited for determining the vertical asymptotes of $f(x)$?

A) $f(x) = \frac{3x-1}{x^2+3x+2}$

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

C) $f(x) = \frac{3x}{x^2+3x+2} - \frac{1}{x^2+3x+2}$

D) $f(x) = (3x-1)(x^2+3x+2)^{-1}$

---

11. Which of the following is an equivalent of $\frac{3}{1-\sqrt{2x}} - \frac{6x}{4x-2}$?

A) $\frac{6x+3\sqrt{2x}}{1-2x}$

B) $\frac{6x-3\sqrt{2x}}{1-2x}$

C) $\frac{2x+\sqrt{2x}}{1+2x}$

D) $\frac{3(x+1+\sqrt{2x})}{1-\sqrt{2x}}$

---

12. Given $\frac{4x^2+20x+25}{2f(x)} = 2x+5$ is true, $f(x)$ must be equal to which *of* the following?

A) $x+5$

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

C) $2x+5$

D) $4x+\frac{5}{2}$

13. If $2x^2 - 5x = 12$ and $x > 0$, what is $x^2 - 3$?

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

B) 5

C) 8

D) 13

---

14. Simplify $\frac{5-\sqrt{6x}}{\frac{7x-2}{\sqrt{6x}+5}} - \frac{9x+6}{6-21x}$

A) $\frac{x-3}{7x-2}$

B) $\frac{9x-3}{2-7x}$

C) $\frac{3x-3}{7x-2}$

D) $\frac{-3(x-9)}{7x-2}$

---

15. Abe is trying to determine how long his wood chopping chores will take him. He devises an equation for x minutes and a stockpile of y logs. If the equation he came up with is given as $y = 5x + 30$, what do the 5 and 30 represent?

A) The 5 represents the number of logs he must chop and the 30 represents how many minutes he has to complete his chore

B) The 5 represents how many minutes he has to complete his chore and the 30 represents the number of logs he must chop

C) The 5 represents the number of logs he chops per minute and the 30 represents the number of logs he started with

D) The 5 represents the number of logs he chops per minute and the 30 represents how many logs he has to chop

16. Which of the following is the equation of a quadratic function with a root at $x = 4$ and an axis of symmetry of $x = 7$?

A) $y = (x - 10)^2 + 9$
B) $y = (x - 4)^2 - 9$
C) $y = (x - 7)^2 + 9$
D) $y = (x - 7)^2 - 9$

17. If $2^{8(x+3a)} = 4^{6+2a}$, what is the value of a^2?

A) $4 + 8x$
B) $8x - 36$
C) $2x - 9$
D) $\sqrt{2x - 9}$

18.

$$x^2 + bx + y^2 = 12$$

Given the equation above, for what value of b will create an equation for a circle with a radius of 4?

19. If the line DE is the perpendicular bisector of the line AB at C such that $DC > CE$, which of the following statements must be true?

I. $AC = CB$
II. $DA = DB$
III. $EB < DB$

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

20. Solve $(3i^3 - i)^2 - (i^2 - 2i^3)^2$.

A) -17
B) $-13 + 4i$
C) $-13 + 4i^3$
D) $-13i + 4i$

SAT Math Test

—Calculator Section—

1. $\frac{7(x-4)+5x}{3} = 8$

In the equation above, what is the value of x?

2. If $-\frac{4}{5} < \frac{x-3}{7} < 1$, then what's the range of values that could be taken by $33x$?

A) $-2.6 < 33x < 10$
B) $-26 < 33x < 10$
C) $-85.8 < 33x < 330$
D) $-858 < 33x < 330$

3. If Jason ingests 49 mg of caffeine for every 12 oz of tea he drinks, how much caffeine will he ingest if he drinks 21 oz of tea?

A) 84
B) 84.75
C) 85.75
D) 86

4. Jared has found that the number of raccoons that will come into his backyard if he leaves out x slices of ham can be modeled by the equation $f(x) = 2x + 3$. How many slices of ham would be have to leave out to attract 47 raccoons?

A) 22
B) 25
C) 44
D) 47

5. $\begin{cases} 4x + 3y < 21 \\ 5x - 3y < 15 \end{cases}$

Which of the following points is not in the solution set of this system?

A) $(3, \frac{5}{3})$
B) $(4, \frac{5}{3})$
C) (0, -4)
D) (0, 4)

6. Find the value of a for which there is no solution to the following system.

$$\begin{cases} 5(y - ax) > 4(7 - y) + 4y - 8 \\ 3y - 2x < 4x + 9 \end{cases}$$

7. Based on the following system of equations, what is the value of xy rounded to the nearest whole number?

$$\begin{cases} 14x - 6y = \frac{22x + 4y}{3} \\ 11y - 9x = 37 \end{cases}$$

A) 71
B) 407
C) 1245
D) The system has no solution.

8. Kelly is putting together the soundtrack for a documentary. For each original song that she wrote that's included in the soundtrack, she'll be paid a $27 royalty, and for every song she uses that was written by someone else, she has to pay $11 for licensing fees. If she made $129, and the documentary contained 9 songs, how many were original songs she wrote?

9. Solve $29\left(\frac{v}{3}-4\right)=7(v+6)+\frac{2v}{3}$ for v.

10. For what value of a does the following system have no solutions?

$$\begin{cases} 12x-4y=-8 \\ y=ax-5 \end{cases}$$

A) 3
B) 4
C) 5
D) Not enough information given.

11. Andy drives a taxi. For every fare, he sets an initial charge of $2.85, and then it costs the rider an additional $2.70 for every mile Andy drives. However, since Andy pays for gas, he loses 7 cents on gas money for each mile he drives. Which equation is a good representation of how much money Andy makes on a fare, where x represents the number of miles he drives?

A) $y=2.85+2.7x$
B) $y=2.78+2.7x$
C) $y=2.85+2.63x$
D) $y=2.85-2.63x$

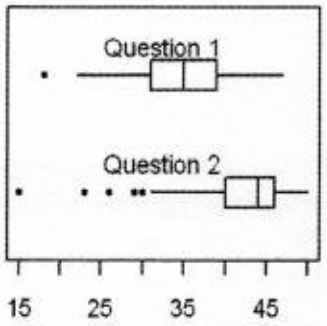
12. When Julia goes to a baseball game, she tries to catch as many foul balls as she can, and she sells them to people in the stadium. She does this so often she has a formula to calculate her profits at a given baseball game: $y=20x-30$. Based on the situation, what does 30 likely represent?

A) How amount she charges per ball.
B) Her average sales.
C) Her average losses.
D) The cost of a ticket to enter the stadium.

13. Find the equation of the line that describes the shortest distance between $(-17,-14)$ and $(28,11)$.

A) $y=5x-41$
B) $y=5x-\frac{41}{9}$
C) $y=\frac{5}{9}x-\frac{41}{9}$
D) $y=-\frac{5}{9}x-\frac{41}{9}$

Mr. Hughes is analyzing answers given on two questions from the last quiz. Based on the box plots below, answer questions 14-15.



14. Using the median of question 1 and question 2, which expression represents the difference?

A) 40-33=7
B) 39-32=7
C) 44-35=7
D) 47-40=7

15. Which question had the largest outlier answer?

A) Question 1: the largest outlier is 47.
B) Question 2: the largest outlier is 50.
C) Question 1: the largest outlier is 18.
D) Question 2: the largest outlier is 15

16. The 500 students at Piedmont High School were surveyed about their favorite candy. They were only allowed to make one selection from a given list of candy types. The frequency chart below shows the results of the survey.

Skittles	43
M&Ms	x
Snickers	112
Gum	y
Peppermint	25

If both x and y are positive integers, what is the greatest possible value for x?

A) 180
B) 160
C) 320
D) 500

---

17. If it takes 5 chefs 20 hours to make a buffet, how many chefs would be needed if the buffet was needed in 10 hours?

A) 2
B) 3
C) 10
D) 40

18. Cedric has been watching the sales at the mall for a particular pair of sneakers he wants. Store 1 has them on sell for 22% off the regular price of $176.14. Store 2 has a 12% and usually sells them for $148.99. Store 3 originally sells the shoes for $165.50 but is running a 20% off sale. Which store would Cedric get the best deal?

A) Store 1
B) Store 2
C) Store 3
D) All 3 stores have the shoes for the same sale price.

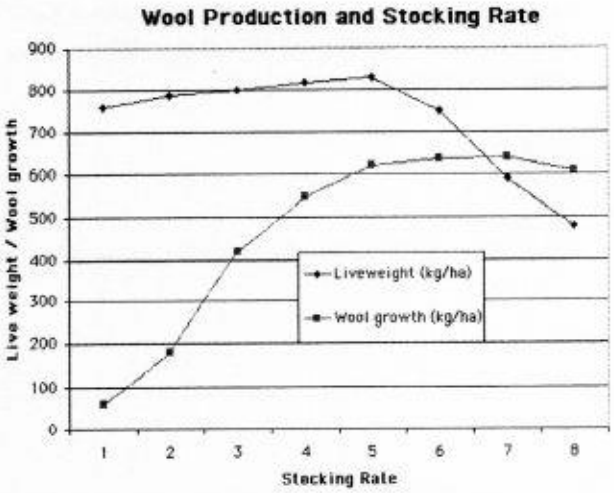
19.

meters	1	2	3	x
yards	1.094	2.187	3.281	6.562

Given the chart of approximate conversions, what is the value for x?

A) 4
B) 5
C) 6
D) 7

Use the following graph to answer questions 20-22.



20. The stocking rate of farms versus the wool growth and live weight of sheep is given in the graph above. What primary relationship is shown between the stocking rate and the amount of wool growth?

A) positive correlation
B) negative correlation
C) no correlation
D) Not enough information given

---

21. At what stocking rate will the wool production and live weight be equivalent?

A) 1
B) 3
C) 5
D) 7

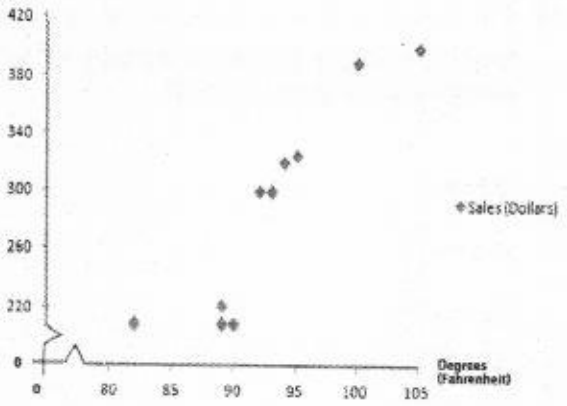
22. The wool growth seems to start to even out and the live weight of the sheep lessens after a certain amount of stock. Which cause could be a factor into this particular change in correlation?

A) The weather could cause the sheep to produce less wool.
B) The resources available are lessened per sheep and it causes the sheep to produce less wool.
C) There isn't enough room on the farm to allow the sheep to grow wool.
D) More sheep dogs are needed to herd the sheep.

---

23. There are 16 students in Veronica's class. Each student had their name entered into a class drawing. Students also earned more entries by making an A on the unit test. 10 students in the class earned an A on the test, including Veronica. What is the probability that Veronica could win the class drawing?

24.



The scatterplot above represents the sales of a lemonade stand at certain weather temperatures. What would most closely represent the correlation coefficient of the line of regression on this scatterplot?

A) -1
B) 0
C) 1
D) Not enough inofrmation is given

---

25. A gold bar has a volume of 25.0 cm^3 and a mass of 483 g. What is the density of gold?

A) 0 .002 g/cm^3
B) 0.051 g/cm^3
C) 19.320g/cm^3
D) 508.000 g/cm^3

---

26. The total cost of a case (24) t-shirts was \$75.00. If the cost per shirt increased by \$0.62 this year, how much will 3 cases cost at the new price?

A) \$223.14
B) \$225.00
C) \$269.64
D) \$270.00

27. The salaries of employees at an engineering company are given below. Estimate the probability that a salary selected at random will be at least \$91,000.

103,000; 115,000; 87,000; 121,000; 89,000; 103,000; 91,000; 83,000; 133,000; 163,000; 85,000; 97,000; 127,000; 89,000; 115,000; 109,000; 91,000; 139,000; 81,000; 109,000

A) 0.1
B) 0.4
C) 0.6
D) 0.7

---

28. Simplify the following expression:

$$3xy\left(\frac{1}{3}x + 6xy\right) + 4y^2(2x - 8x^2) - (9xy + 7x)^2$$

A) $8xy^2 - 125x^2y - 95x^2y^2 - 49x^2$
B) $8xy^2 - 111x^2y - 113x^2y^2 - 49x^2$
C) $-103x^2y - 95x^2y^2 - 49x^2$
D) $-111x^2y - 87x^2y^2 - 49x^2$

29.

$$f(x) = 2x^2 - 9x$$
$$g(x) = 6x - 18$$

Given the two functions listed above, which of the following would be solutions for $\frac{f(x)-g(x)}{f(g(x))} = 0$?

A) $\frac{2}{3}$
B) 1
C) 3
D) 6

30. $\begin{cases} 2x + 3y = 7 \\ y = 3x^2 - 2x - 7 \end{cases}$

If (x, y) is a solution for the above system of equations and $xy > 0$, which of the following is equivalent to $3x - 2y$?

---

31. $f(x) = x^3 + 11x^2 + 16x - 84$
$g(x) = x^2 - x - 2$
$h(x) = x^2 + 10x + 21$

For the system of equations above, let a be the number of roots shared by $f(x)$ and $g(x)$ and let b be the number of roots shared by $f(x)$ and $h(x)$. What is $a + b$?

---

32. If $f(x)$ is a function such that $f(0) = 8, f(1) = 0, f(2) = 5$, and $f(5) = 0$, what is $f\left(f^{-1}(f(5))\right) + f(2)$?

---

33. If $\frac{h(x)}{g(x)} = x - 2$ and $\frac{g(x)}{f(x)} = x + 3$, then solve $\frac{f(x)}{h(x)}$.

A) $g(x)(x - 2)$

B) $(g(x))^2$

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

D) $\frac{1}{(x-2)(x+3)}$

34. Which of the following functions has a horizontal asymptote of $y = 0$, has a domain of all real numbers, and a range of $y > 0$?

A) $y = \frac{1}{x}$

B) $y = \frac{1}{x^2}$

C) $y = 2^x$

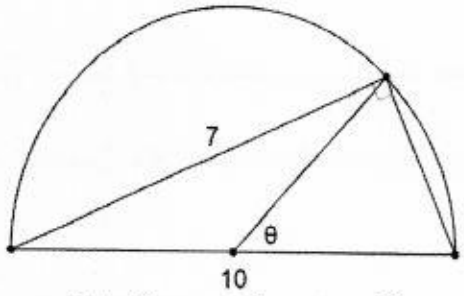
D) $y = lnx$

---

35. A knight intends to build a ladder to bridge a moat and scale a wall. The moat is 6 feet wide and there is 1 foot of ground between the base of the wall and the moat. The knight is unsure of how tall the wall is but determines that the edge of the moat makes a 20 degree angle with the top of the wall. If it will cost the knight half a gold piece for each foot of ladder builds, what is the minimum he must pay to scale the wall?

A) 3
B) 3.7
C) 4.5
D) 7.4

36.

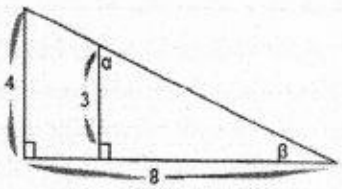


[Note: Figure not drawn to scale]

Given the figure above, where 10 is the diameter, what is the value of θ.

A) 10
B) 15.4
C) 44.4
D) 91.2

37.

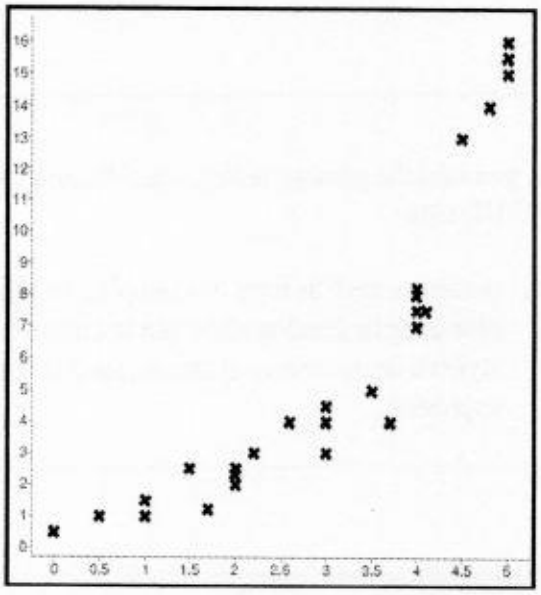


[Note: Figure not drawn to scale]

Given the figure above, solve $2\cos\alpha + 3\sin\beta$.

A) 0.44
B) 0.89
C) 1.34
D) 2.2

38. Below is a scatterplot.



Which of the following equations best describes the relationship given in the scatterplot?

A) $y = 2x$
B) $y = \frac{1}{2}x$
C) $y = 2\left(\frac{1}{2}\right)^x$
D) $y = \frac{1}{2}(2)^x$

Test 5

SAT Math Test

—No Calculator Section—

1. $4 - \frac{x-a}{2} = 3a + 1$

When $x = 1$, what is the value of a?

2. $(a + 3)x < 6$

If $x < 3$, what is the possible value of a?

A) 10
B) 7
C) 6
D) 4

3. Mrs. Smith makes cakes on the weekends. She only has enough time to make a maximum of eight cakes per month, but she's hoping to make at least $600 this month. She sells tiered cakes for $150 per cake and single layer cakes are $70 each. Which system of inequalities can be used to find the number of tiered cakes (t) and single layer cakes (s) that Mrs. Smith would need to sell this month to accomplish her goal?

A) $\begin{cases} 70t + 150s \geq 600 \\ t + s \leq 8 \end{cases}$

B) $\begin{cases} 150t + 70s \leq 600 \\ t + s \geq 8 \end{cases}$

C) $\begin{cases} 150t + 70s \geq 600 \\ t + s \leq 8 \end{cases}$

D) $\begin{cases} 70t + 150s \leq 600 \\ t + s \geq 8 \end{cases}$

4. Find the value of $16k + 2$ for which there are infinitely many solutions to the following system at any value of x.

$$(8k - 6)x = 0$$

5. Find a range of m for which there is no solution to the following system.

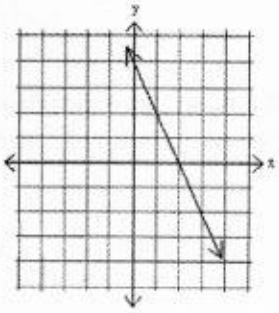
$$\begin{cases} 5x < 2x + 9 \\ (m + 3)x \geq 12 \end{cases}$$

A) $m \geq 1$
B) $m > 1$
C) $m \leq 1$
D) $m < 1$

6. $\begin{cases} y > x - 2 \\ y = ax \end{cases}$

What is the value of a at any x?

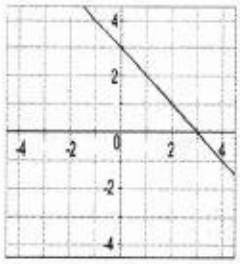
7. Which equation represents the graph below?



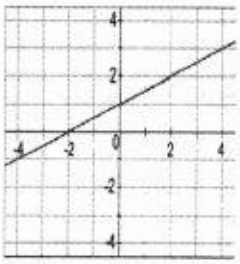
A) $y = 2x + 4$
B) $2x + y = 4$
C) $4x + y = 2$
D) $y = 4x + 2$

8. Which graph is represented by the equation $-\frac{x}{2} + y = 1$?

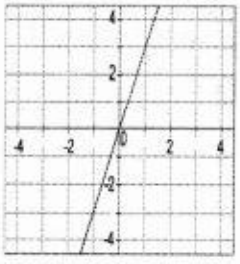
A)



B)



C)



D)

9. Simplify $(3\sqrt{x} + 5)^2 + (2\sqrt{3x} - 4\sqrt{x})^2$.

A) $5x + 25$
B) $37x + 25$
C) $(37 - 16\sqrt{3})x + 30\sqrt{x} + 25$
D) $-7x + 15\sqrt{x} + 25$

10. Which of the following is an equivalent form of $y^4 - x^2 + x^2y^2 - 1$?

A) $(y^2 + x^2 + 1)(y^2 - 1)$
B) $(y^2 - x^2 + 1)(y^2 + 1)$
C) $(y^2 + 1)(y^2 - 1)$
D) $(y^2 - x)^2 - 1$

11. Simplify the following equation.

$$(5 + 3xy)^2 + 7y(2xy + 7x) - 8(3x^2y^2 - 4xy^2)$$

A) $-15x^2y^2 + 81xy^2 + 14xy^4 + 30xy + 25$
B) $-15x^2y^2 + 46xy^2 + 79xy + 25$
C) $-24x^2y^2 + 46xy^2 + 79xy + 25$
D) $9x^2y^2 + 24xy^2 + 54xy - 25$

12. Which of the following is equivalent to $\frac{\frac{1}{+1} - \frac{2}{x-5}}{\frac{x+2}{+7}}$?

A) $\frac{x+2}{(x+1)(x-5)}$

B) $\frac{-(x+2)}{(x+1)(x-5)}$

C) $\frac{-(x+7)^2}{(x+1)(x+2)(x-5)}$

D) $\frac{1}{(x+1)(x+2)(x-5)}$

13. $\frac{1}{J}+\frac{1}{P}+\frac{1}{C}=\frac{1}{6}$

John, Paul and Chris are carpenters working on a custom desk for a client. Together, it takes the three men 6 hours to complete a desk. The equation above represents the situation described, where J represents John, P represents Paul, C represents Chris, and $J > P > C$. Which man does the most work on the desk?

A) John
B) Paul
C) Chris
D) It cannot be determined.

14. Consider three functions $f(x)$, $g(x)$, and $h(x)$, where $f(x)$ and $g(x)$ are cubic functions, and $h(x)$ is a quadratic function. What is the maximum number of solutions a system of the three equations could possibly have?

15. If $ax + z(2x + 2y - 5) = 4 - ay$, determine the value of $x + y$.

A) $\frac{2z-5z}{4-a}$

B) $\frac{4+5z}{a+2z}$

C) $\frac{4-5z}{a+z}$

D) $\frac{2z+9}{5z+2}$

16. Which of the following functions has an asymptote, a domain of all real numbers, and a range of only positive numbers?

A) $y = \frac{1}{x}$

B) $y = \frac{1}{x^2}$

C) $y = x^2+1$

D) $y = 2^x$

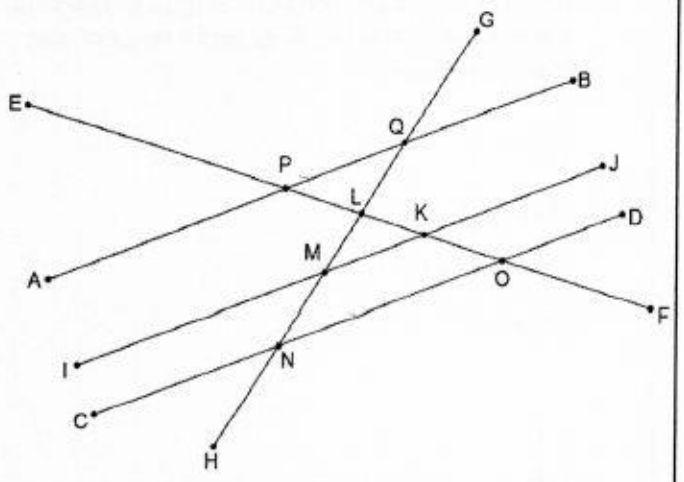
17. Which form of the function $f(x)$ is best suited for determining the vertex of the function?

A) $f(x) = (x - 3)(2x + 2)$
B) $f(x) = 2(x - 1)^2 - 8$
C) $f(x) = 2((x - 1)^2 - 1) - 6$
D) $f(x) = 2(x^2 - 2x - 3)$

18. Simplify $((3i - i^2)^2)^2$.

A) $6i - 8$
B) $28 - 96i$
C) $64 - 36i$
D) $234i + 415$

19.



In the figure above, $AB \| CD$. Which of the following must be true in order for $IJ \| AB$ to also be true?

A) $m\angle MQB + m\angle DOF = 180$
B) $m\angle GQA = m\angle HND$
C) $m\angle PKJ = m\angle POD$
D) $m\angle PKJ = m\angle QMI$

---

20. A circle centered at $(2, 3)$ has the point $(-1, -1)$ on its circumference. If the equation of the circle is $(x-2)^2 + (y-3)^2 = d$, then what is the value of d?

SAT Math Test

---Calculator Section---

1. Joseph has been saving for a video game system that costs $500. He already has $200 and puts away $24 a week. How many weeks does Joseph have to save his money before he will be able to purchase the game system?

2. Tyler made $425 last week. His goal is to make more this week. The furniture store pays him $85 a week and a 5% commission on any sales he makes. If Tyler achieves his goal, then which inequality represents Tyler's earnings this week?

   A) $425 + 0.05x > 85$

   B) $85 + 0.05x > 425$

   C) $425 + 0.50x < 85$

   D) $85 + 0.50x > 425$

3. If $-\frac{1}{3} < -5t + 1 < 16$, what is one possible value of t?

   A) $-3 < t < \frac{4}{15}$

   B) $-8 < t < \frac{9}{5}$

   C) $-\frac{4}{15} < t < 3$

   D) $-\frac{9}{5} < t < 8$

4. If $-x + y = -5$, what is the value of $\frac{4x}{y+5}$?

5. If $\frac{b}{a} = 2$, what is the value of $\frac{(a-b)^2}{5a^2}$?

6. What is a solution to the following system of inequalities?

$$\begin{cases} y - 2x \leq 4 \\ y + 3x \geq 3 \end{cases}$$

   A) $(1, -3)$

   B) $(4,2)$

   C) $(-1, -2)$

   D) $(-\frac{1}{2}, 4)$

7. The total cost of a hamburger and a soft drink is $2.10. The total cost of two hamburgers and a soft drink is $3.50. What is the cost of a soft drink?

   A) $0.50
   B) $0.55
   C) $0.70
   D) $1.40

8. $\begin{cases} \frac{1}{3}x + \frac{1}{6}y = 1 \\ kx + 2y = 12 \end{cases}$

In the system of linear equations above, k is a constant. If the system has infinitely many solutions, what is the value of k?

9. $\begin{cases} 2x + 3y = 2 \\ \left(a + \frac{2}{3}\right)x + (b+2)y = 4 \end{cases}$

If the system above has no solution, what is the value of $(4b - 6a)^{2b-3a}$? (a and b are constants.)

10. $\begin{cases} ax + by + c = 0 \\ cx + ay + b = 0 \end{cases} (a, b, c \neq 0)$

In the system of linear equations above, a, b, and c are constants. If the system has infinitely many solutions, what is the value of $x^3 + y^3 - 3xy$?

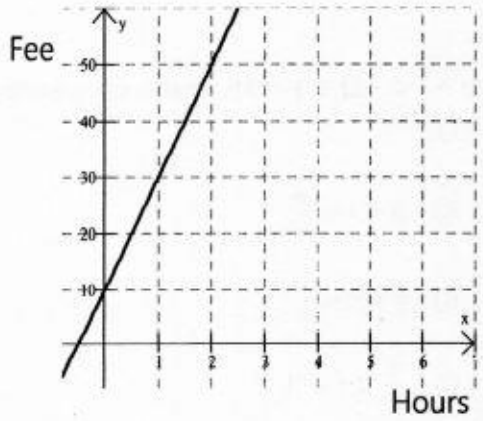
A) -1
B) 0
C) 1
D) Not enough information

11. Jace makes and sells backpacks. The backpacks cost him \$15 each to make and he sells them for \$30. On Saturday he will be renting a kiosk at the mall for \$80 to sell his backpacks. How many backpacks must Jace sell in order to make a profit of \$300?

12. Jasmine is taking a taxi from her school to the library. The taxi charges an initial fee of \$2.50 plus \$1.50 per mile. The school is 4.2 miles from the library. How much will it cost Jasmine to get to the library?

A) \$4.00
B) \$6.30
C) \$8.80
D) \$12.00

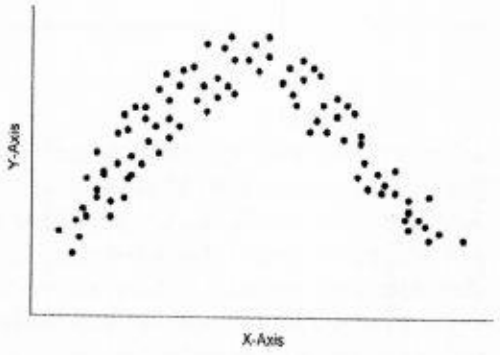
13. A computer repair technician charges a \$10 flat fee and an hourly service charge. According to the graph below, how much does the technician make per hour?



A) \$5
B) \$9
C) \$12
D) \$20

14. Sarah wants to run a race. She has been running half marathons which are 13.1 miles long. The race she is registered for is a 10K, which is 10 kilometers. If 1 mile is 1.61 km, how far will Sarah run, in miles, at this race?

15. What kind of function would describe the relationship of the data points in the graph below?



A) Linear
B) Quadratic
C) Exponential
D) Trigonometric

16. 1000 households were surveyed about how many cars they own. The data is represented in the frequency chart below. Based on the chart, what is the probability that a household with less than two cars would be chosen at random?

Cars	Households
0	125
1	256
2	428
3	108
4	83

A) 0.809
B) 0.125
C) 0.428
D) 0.553

17. A block of an unknown material measures 13 cm by 5 cm by 9 cm. If water has a density of 1.00 g/cm^3, what is the greatest mass that the block can have and still float?

A) 0.0017 g
B) 5.85 g
C) 17.00 g
D) 585.0 g

18. If a ball has a density of 0.35 g/mL and a mass of 125 g, what would be its volume?

A) 0.0028 mL
B) 43.75 mL
C) 124.65 mL
D) 357.14 mL

19. There are 5000 bacteria in a culture, and the number of bacteria triples each hour. The number of bacteria after t hours can be found using the formula $y = 5000(3)^t$. How long will it take for the culture to surpass 1 million bacteria?

A) 5 hours
B) 25 hours
C) 66 hours
D) 200 hours

20. The arithmetic mean of a set of four numbers is 25. If three of the numbers in the set are 9, 29, and 33, what is the missing number?

A) 10
B) 24
C) 29
D) 32

21. The population of a town is 5000 people. It is predicted that the population will grow by 2.5% annually. What is the projected population of the town in five years?

A) 5520
B) 5657
C) 15,259
D) 488,282

Use the frequency tables below to answer questions 22-24.

Ice Cream Toppings	Price
Hot Fudge	$1.99
Whipped Cream	$0.65
Bananas	$1.19

Monthly Sales

	Hot Fudge	Whipped Cream	Bananas
Pattie's Parlor	127	250	63
Cone N' Cream	119	142	44

22. The average monthly sales of ice cream toppings at two shops are shown above. If Pattie's Parlor sold 324 cups of ice cream this month, what percentage of their sales included whipped cream?

A) 19%
B) 39%
C) 43%
D) 77%

23. It costs Cone N' Cream $0.71 per serving of hot fudge and $1.25 per serving of ice cream. They charge the customer $3.59 for a cup of ice cream with no toppings. Based on this month's sales, how much profit did the shop make on the cups sold with hot fudge?

A) $193.97
B) $233.24
C) $430.78
D) $664.02

---

24. A family of four went to Cone N' Cream. The price per cup of ice cream is $3.59 with no toppings. Mom ordered a vanilla cup and added hot fudge and whipped cream. Dad ordered a cup of chocolate ice cream with bananas on top. The sister wanted a plain vanilla cup and the brother wanted strawberry with all of the toppings. How much was the family's bill after the 4% sales tax?

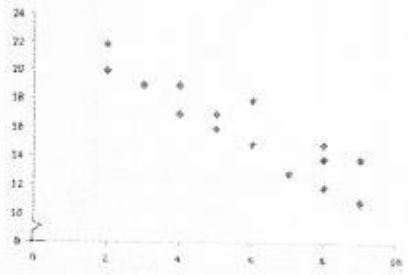
A) $14.93
B) $22.02
C) $22.90
D) $30.83

---

25. The population of a small village was 5,500 in 2005. The population of the village started decreasing at a rate of 1.9% every year. What was the population of the village in 2009?

A) 4,997
B) 5,094
C) 5,930
D) 6,043

26. What is the most appropriate correlation coefficient for the scatterplot below?



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

27. Joseph got an 85 on his psychology exam, which is 2 standard deviations above the mean. If the standard deviation for the psychology exam is 4, what is the mean?

28. $f(x)$ is a parabolic function. If $f(x)$ has one root at $x = -4$ and another at $x = 1$, which of the following equations represents $f(x)$?

A) $y = x^2 - 3x - 4$
B) $y = x^2 + 3x - 4$
C) $y = (x-4)^2 + 1$
D) $y = (x+4)^2 - 1$

29. Solve $6x^2 - 5 = -2x$.

A) $\frac{-1\pm6}{6}$
B) $\frac{-1\pm\sqrt{30}}{6}$
C) $\frac{-1\pm\sqrt{31}}{6}$
D) No solution

30. Solve $(2\sqrt{x}+3)(\sqrt{x}-1) = 0$.

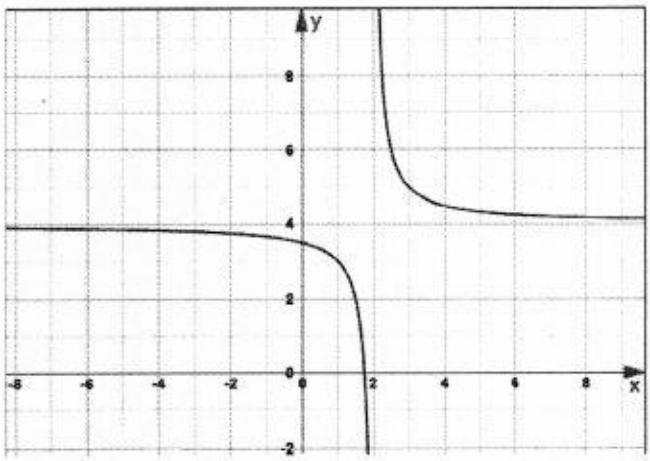
A) $-\frac{9}{4}$
B) $-\frac{3}{2}$
C) -1
D) 1

31. Consider the solutions of the following system of equations. If $x > 0$, then what is the value of y?

$$\begin{cases} y = \frac{3}{2}x + 2 \\ y = (x+1)^2 - 3 \end{cases}$$

A) $\frac{13+3\sqrt{65}}{8}$
B) $\frac{-1+\sqrt{65}}{4}$
C) $\frac{14+4\sqrt{10}}{3}$
D) $\frac{14+4\sqrt{10}}{9}$

32. The graph below is best represented by which of the following equations?



A) $y = \frac{1}{x}$

B) $y = \frac{1}{2x+4}$

C) $y = \frac{1}{x-2} + 4$

D) $y = \frac{1}{x+2} + 4$

---

33. Which of the following is a solution to the system of equations below?

$$\begin{cases} y = 3x - 2 \\ y = (x-1)^2 + 1 \end{cases}$$

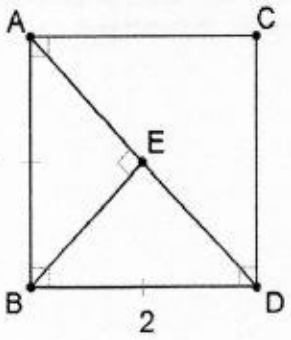
A) $(0, -2)$
B) $(1,2)$
C) $(4,10)$
D) No solution

---

34. Given functions $f(x) = x^2 - 3x$ and $g(x) = 4x^2 - 6$, solve $f(g(2) + 5)$.

A) 30
B) 36
C) 100
D) 180

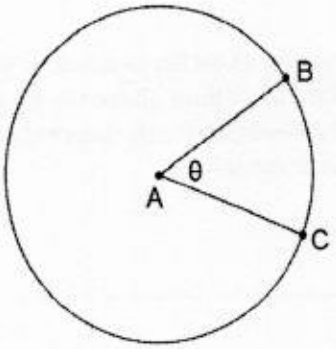
35.



Square $ABDC$ is pictured above. It has a side length of 2. Determine the value of $BE + AD$.

A) $\sqrt{2}$
B) 2
C) $3\sqrt{2}$
D) $2 + \sqrt{2}$

36.



The above image is a circle with center A and an unknown diameter. If $\theta = 25°$ and the minor arc $\widehat{BC}$ has a measure of 10, determine the diameter of the circle.

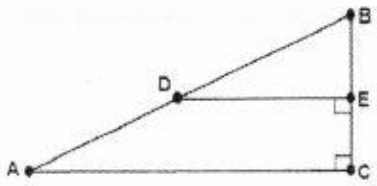
A) $\frac{25}{360\pi}$

B) $\frac{10}{\pi}$

C) $\frac{144}{\pi}$

D) $\frac{720}{\pi}$

37.



[Note: Figure not drawn to scale.]

In ΔABC, $BE = EC$, $AC = 5$, and $m\angle ABC = 30°$. Determine the length of the line BE.

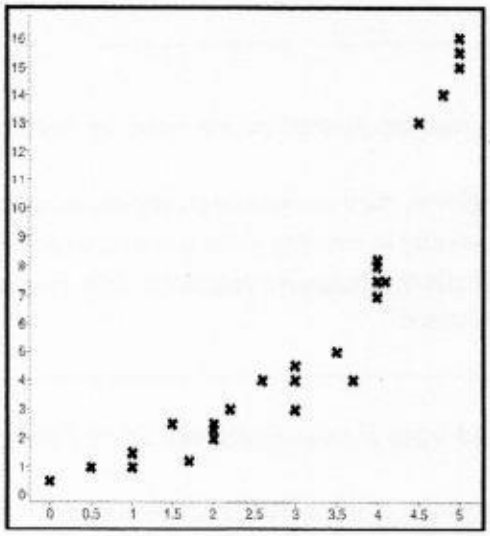
A) $\sqrt{2}$

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

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

D) $\frac{5\sqrt{3}}{2}$

38. Below is a scatterplot.



Which of the following points would be a good estimate for y when $x = 4.25$?

A) 10
B) 7
C) 4
D) 13

Math Test

No Calculator Section

1.	7/2	6.	D	11.	D	16.	B
2.	30	7.	C	12.	B	17.	C
3.	C	8.	2	13.	D	18.	C
4.	A	9.	1	14.	C	19.	D
5.	D	10.	C	15.	A	20.	50

Math Test

Calculator Section

1.	C	9.	B	19.	D	29.	A
2.	D	10.	C	20.	C	30.	B
3.	C	11.	A	21.	B	31.	C
4.	54	12.	6	22.	C	32.	D
5.	Any value greater than 7/15 and less than 12/25	13.	B	23.	C	33.	A
		14.	D	24.	C	34.	5
		15.	C	25.	A	35.	D
6.	C	16.	A	26.	B	36.	20/3
7.	2	17.	B	27.	A	37.	A
8.	A	18.	C	28.	1 or 25	38.	B

Math Test

No Calculator Section

1. B
2. C
3. B
4. 0<k<2
5. 3/4
6. A
7. D
8. A
9. C
10. D
11. A
12. D
13. C
14. C
15. 2
16. 2
17. C
18. D
19. C
20. 65

Math Test

Calculator Section

1. D
2. B
3. A
4. C
5. 30
6. D
7. B
8. D
9. 3/55
10. C
11. 3
12. B
13. C
14. A
15. D
16. B
17. C
18. C
19 B
20. B
21. B
22. 5/8
23. 12
24. B
25. B
26. A
27. D
28. 3
29. 6
30. A
31. 4 or 100/27
32. C
33. B
34. B
35. A
36. B
37. B
38. A

Math Test

No Calculator Section

1.	6	6.	2	11.	11	16.	B
2.	7	7.	C	12.	A	17.	D
3.	A	8.	A	13.	D	18.	C
4.	6	9.	C	14.	D	19.	D
5.	D	10.	B	15.	D	20.	A

Math Test

Calculator Section

1.	A	11.	108	21.	B	31.	D
2.	C	12.	138	22.	C	32.	1
3.	C	13.	B	23.	D	33.	C
4.	2/9	14.	B	24.	A	34.	B
5.	D	15.	B	25.	D	35.	C
6.	1	16.	C	26.	C	36.	B
7.	D	17.	B	27.	1	37.	D
8.	10	18.	A	28.	D	38.	D
9.	6	19	D	29.	D		
10.	C	20.	C	30.	C		

Math Test

No Calculator Section

1. 8
2. 25
3. A
4. D
5. 1
6. 3
7. 2
8. A
9. C
10. B
11. D
12. B
13. D
14. D
15. C
16. D
17. C
18. 4
19. D
20. B

Math Test

Calculator Section

1. 13/3
2. C
3. C
4. 22
5. 8
6. 2
7. C
8. 6
9. 79
10. 3
11. C
12. D
13. C
14. D
15. D
16. C
17. C
18. B
19. C
20. A
21. D
22. B
23. 1/13
24. C
25. C
26. C
27. D
28. A
29. D
30. 4
31. 2
32. 5
33. D
34. C
35. B
36. D
37. D
38. D

Math Test

No Calculator Section

1.	1	6.	C	11.	B	16.	D
2.	5	7.	B	12.	C	17.	B
3.	C	8.	B	13.	C	18.	B
4.	14	9.	C	14.	2	19	C
5.	C	10.	A	15.	B	20.	25

Math Test

Calculator Section

1.	13	11.	26	21.	B	31.	A
2.	B	12.	C	22.	D	32.	C
3.	A	13.	D	23.	C	33.	C
4.	4	14.	6.21	24.	C	34.	D
5.	1/5	15.	B	25.	B	35.	C
6.	B	16.	D	26.	A	36.	C
7.	C	17.	D	27.	77	37.	D
8.	4	18.	D	28.	B	38.	A
9.	1/ 16	19	A	29.	C		
10.	A	20.	C	30.	D		

Math Test

No Calculator Section

1. 5
2. 12
3. A
4. C
5. A
6. C
7. 8
8. A
9. 3
10. B
11. D
12. C
13. 19
14. A
15. A
16. D
17. B
18. C
19. D
20. C

Math Test

Calculator Section

1. 115
2. B
3. 135
4. 57
5. D
6. A
7. 3.61
8. 5
9. 21
10. C
11. C
12. B
13. D
14. A
15. A
16. B
17. C
18. 15
19. C
20. A
21. C
22. C
23. C
24. C
25. D
26. D
27. 23
28. D
29. B
30. A
31. A
32. A
33. B
34. C
35. C
36. C
37. D
38. C

Math Test

No Calculator Section

1.	B	6.	A	11.	C	16.	3
2.	6	7.	A	12.	B	17.	C
3.	4.2	8.	21	13.	D	18.	D
4.	2	9.	B	14.	A	19.	A
5.	C	10.	C	15.	C	20.	A

Math Test

Calculator Section

1.	C	10.	D	20.	C	30.	D
2.	A	11.	$48.75	21.	B	31.	B
3.	8/3	12.	B	22.	1.20	32.	A
4.	6	13.	0.61	23.	A	33.	C
5.	126	14.	B	24.	A	34.	16
6.	D	15.	A	25.	C	35.	C
7.	C	16.	C	26.	A	36.	C
8.	C	17.	C	27.	D	37.	B
9.	Any value between 18.23 and 19.44	18.	D	28.	D	38.	C
		19.	C	29.	D		

lath Test

o Calculator Section

2
30
D
C
4/3

6. 3
7. C
8. B
9. 4
10. A

11. C
12. C
13. C
14. D
15. C

16. C
17. D
18. 14
19. C
20. C

lath Test

alculator Section

58
B
11
65
D
7
C
3
28
B

11. C
12. C
13. C
14. C
15. C
16. B
17. C
18. B
19 3
20. B

21. B
22. D
23. C
24. B
25. B
26. D
27. A
28. 3
29. D
30. A

31. C
32. D
33. C
34. B
35. C
36. D
37. C
38. A

Math Test

No Calculator Section

1.	5	6.	2	11.	D	16.	C
2.	28	7.	A	12.	C	17.	C
3.	B	8.	D	13.	C	18.	9
4.	C	9.	D	14.	B	19.	D
5.	1	10.	B	15.	A	20.	C

Math Test

Calculator Section

1.	5	11.	D	21.	B	31.	A
2.	B	12.	B	22.	D	32.	A
3.	23	13.	B	23.	B	33.	A
4.	84	14.	105	24.	C	34.	B
5.	B	15.	D	25.	D	35.	C
6.	6	16.	B	26.	D	36.	B
7.	B	17.	A	27.	B	37.	B
8.	4	18.	A	28.	D	38.	C
9.	11	19.	4	29.	C		
10.	C	20.	B	30.	C		

Math Test
No Calculator Section

1. 18
2. A
3. C
4. 75
5. D
6. 12
7. 5
8. D
9. C
10. B
11. D
12. B
13. C
14. D
15. C
16. C
17. A
18. D
19. 15
20. B

Math Test
Calculator Section

1. C
2. 3/4
3. Any value greater than 11 and less than 63/5
4. B
5. A
6. B
7. 2
8. A
9. D
10. B
11. 23
12. B
13. 108
14. C
15. C
16. D
17. C
18. D
19. A
20. 58
21. C
22. D
23. A
24. B
25. B
26. A
27. B
28. 4
29. C
30. D
31. B
32. A
33. C
34. D
35. C
36. A
37. 15/4 or 3.75
38. C