Math Test – Calculator

40 MINUTES, 25 QUESTIONS

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

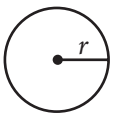
DIRECTIONS

For questions 1-21, solve each problem, choose the best answer from the choices provided, and fill in the corresponding circle on your answer sheet. **For questions 22-25,** solve the problem and enter your answer in the grid on the answer sheet. Please refer to the directions before question 22 on how to enter your answers in the grid. You may use any available space in your test booklet for scratch work.

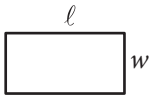
NOTES

1. The use of a calculator **is permitted**.
2. All variables and expressions used represent real numbers unless otherwise indicated.
3. Figures provided in this test are drawn to scale unless otherwise indicated.
4. All figures lie in a plane unless otherwise indicated.
5. Unless otherwise indicated, the domain of a given function f is the set of all real numbers x for which $f(x)$ is a real number.

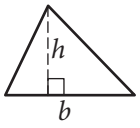
REFERENCE



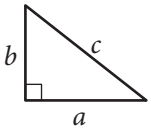
$A = \pi r^2$
$C = 2\pi r$



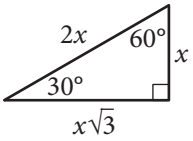
$A = \ell w$

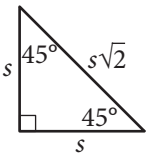


$A = \frac{1}{2}bh$

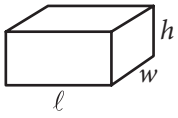


$c^2 = a^2 + b^2$

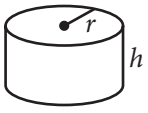




Special Right Triangles

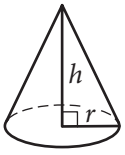


$V = \ell wh$

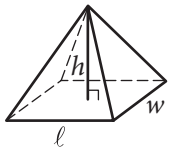


$V = \pi r^2 h$

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



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



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

The number of degrees of arc in a circle is 360.
The number of radians of arc in a circle is 2π.
The sum of the measures in degrees of the angles of a triangle is 180.

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CONTINUE

1

Charissa ordered 3 cans of lemonade for each person at her party. She also ordered 1 pizza for every 4 people. If she ordered 6 pizzas, which of the following could be the number of cans of lemonade she ordered?

A) 36

B) 48

C) 60

D) 72

2

A bakery sells trays of cookies. Each tray contains at least 50 cookies but no more than 60. Which of the following could be the total number of cookies on 4 trays of cookies?

A) 165

B) 205

C) 245

D) 285

3

A survey taken by 1,000 students at a school asked whether they played school sports. The table below summarizes all 1,000 responses from the students surveyed.

	Males	Females
Play a school sport	312	220
Do not play a school sport	?	216

How many of the males surveyed responded that they do not play a school sport?

A) 109

B) 252

C) 468

D) 688

4

A waiter receives tips from each customer. On average, the tip is 15% of the customer's bill. At this rate, which of the following is closest to the tip the waiter can expect when a customer has a bill that is $78.20 ?

A) $8.00

B) $10.00

C) $12.00

D) $14.00

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5

The table below shows the high and low temperatures in Houston, Texas, during a five-day period.

Temperatures in Houston, Texas
(degrees Fahrenheit)

	Monday	Tuesday	Wednesday	Thursday	Friday
High temperature	73	56	62	75	81
Low temperature	49	37	41	54	63

What was the mean low temperature, in degrees Fahrenheit, during the five-day period?

A) 48.8

B) 49

C) 59

D) 59.1

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6

A random sample of 50 people from a town with a population of 14,878 were asked to name their favorite flavor of ice cream. If 7 people in the sample named chocolate as their favorite ice-cream flavor, about how many people in the town would be expected to name chocolate?

A) 350

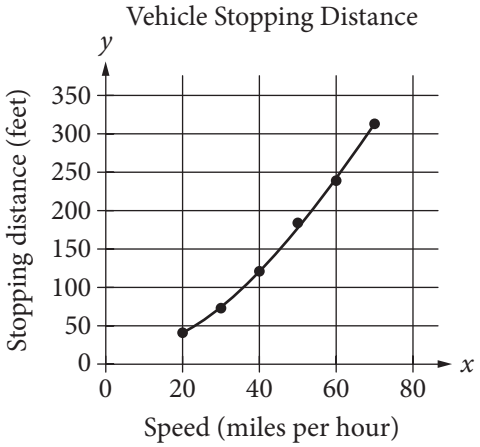
B) 2,100

C) 7,500

D) 10,500

7

A study was done to determine a new car's stopping distance when it was traveling at different speeds. The study was done on a dry road with good surface conditions. The results are shown below, along with the graph of a quadratic function that models the data.



According to the model, which of the following is the best estimate for the stopping distance, in feet, if the vehicle was traveling 55 miles per hour?

A) 25

B) 30

C) 210

D) 250

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8

The equations below show the total amount of water in gallons, y, that has flowed through two different types of showerheads after x minutes of use.

Type A: $y = 1.25x$

Type B: $y = 2.50x$

Based on these equations, which of the following statements is a correct comparison?

A) For each minute of use, the amount of water that flowed through Type B is twice the amount that flowed through Type A.

B) For each minute of use, the amount of water that flowed through Type A is twice the amount that flowed through Type B.

C) The amount of water that flowed through Type A per minute increased at a faster rate than the amount of water that flowed through Type B per minute.

D) The amount of water that flowed through Type B per minute increased at a faster rate than the amount of water that flowed through Type A per minute.

9

A certain number of cubic yards of concrete will be poured to form a driveway. The concrete will fill a space that is a right rectangular prism that is 18 feet wide, 42 feet long, and 6 inches thick. What are the dimensions of this space (width by length by thickness) in yards? (Note: 1 foot = 12 inches and 1 yard = 3 feet)

A) 6 yards by 14 yards by $\frac{1}{6}$ yard

B) 6 yards by 14 yards by $\frac{1}{2}$ yard

C) 54 yards by 126 yards by 72 yards

D) 54 yards by 126 yards by 216 yards

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CONTINUE

10

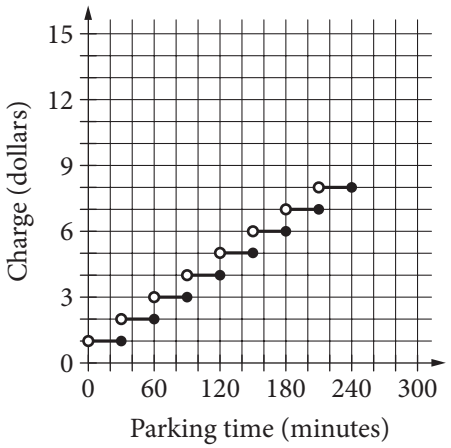
The charges for a parking garage are shown below.

Parking Garage Charges
(maximum of 4 hours)

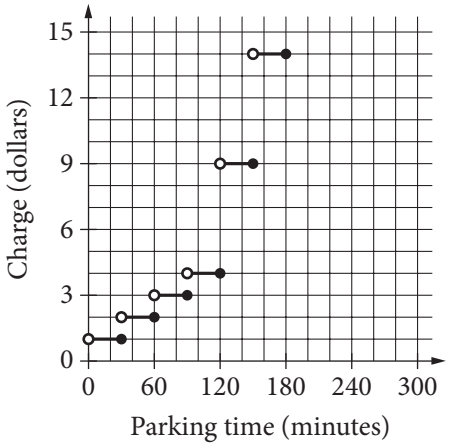
Charge ($)	Parking time (minutes)
1	up to 30
2	over 30 and up to 60
3	over 60 and up to 90
4	over 90 and up to 120
9	over 120 and up to 180
14	over 180 and up to 240

Which graph shows the relationship between the parking time, in minutes, and the charge, in dollars?

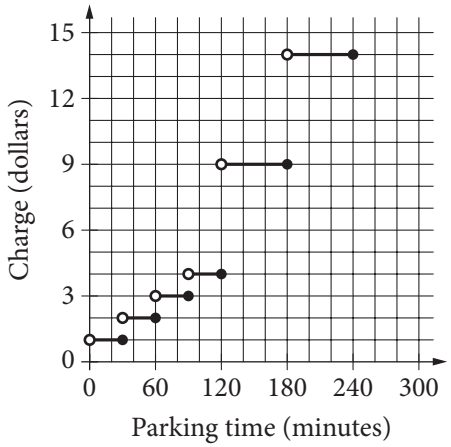
A)



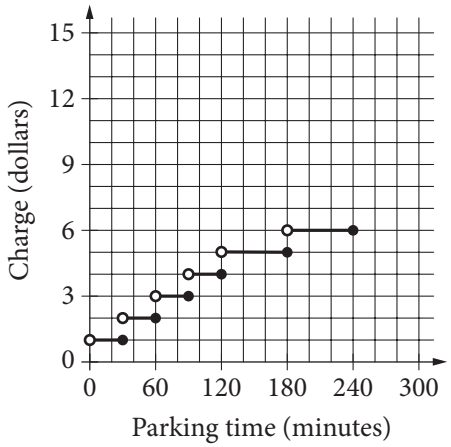
B)



C)



D)



11

A sterling silver platter is made up of a mixture of silver and copper. The ratio of silver to copper is 37 : 3 by mass. If the platter has a mass of 600 grams, what is the mass, in grams, of the copper in the platter?

A) 18

B) 45

C) 222

D) 555

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Questions 12-14 refer to the following information.

Rocco is saving money to buy his first car. He works 15 hours each week and saves $10 for each hour he works. Rocco has already saved $3,500 and plans to save at least $5,300. He knows there will be an 8.5% sales tax on the purchase price of the car and a title transfer fee of $15. He will use the formula below to determine his gas mileage, y, in miles per gallon, from the number of miles, m, the car can be driven using g gallons of gas.

$$y = \frac{m}{g}$$

12

Rocco will need to pay a total of $5,246.87 for the car, including the sales tax and transfer fee. To the nearest dollar, what is the purchase price of the car Rocco plans to buy?

A) $4,787

B) $4,822

C) $5,223

D) $5,708

13

Which formula can Rocco use to determine the number of miles he can expect to drive using a certain number of gallons of gas?

A) $m = \frac{y}{g}$

B) $m = \frac{g}{y}$

C) $m = g + y$

D) $m = gy$

14

Which inequality can Rocco use to model the number of weeks remaining, x, that he will need to work before he has saved at least $5,300 ?

A) $3{,}500 + 150x \geq 5{,}300$

B) $3{,}500 \leq 150x + 5{,}300$

C) $3{,}500 \leq 150 + 5{,}300x$

D) $3{,}500x + 150 \geq 5{,}300$

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15

The table below shows the lengths in centimeters (cm) of a sample of 5 leaves from a tree.

Leaf	Length (cm)
1	14.2
2	13.8
3	12.6
4	13.4
5	11.5
6	?

A 6th leaf is added to the sample and its length is measured. Its measure increases the mean value of the sample of leaves but decreases the median value of the sample of leaves. What is a possible measurement for the length of the 6th leaf?

A) 13.1 cm

B) 13.3 cm

C) 13.4 cm

D) 13.7 cm

16

A theater is showing one movie today. A media research company randomly selected people coming out of the theater to rate, on a 5-star scale, the movie they just saw. The results of the survey are shown in the table below.

Movie Ratings

Rating	Frequency
★	8
★ ★	12
★ ★ ★	17
★ ★ ★ ★	19
★ ★ ★ ★ ★	14

A total of 325 people saw the movie in that theater. Based on the survey results, about how many of the people who saw the movie would have rated it with 3 or more stars?

A) 50

B) 80

C) 230

D) 305

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CONTINUE

Questions 17 and 18 refer to the following information.

Experts say vitamin C is a nutrient that provides many health benefits. The amount of vitamin C, in milligrams (mg), found in 100 grams (g) of each of several fruits is shown in the table below.

Vitamin C Content in Fruits

Type of fruit	Amount of vitamin C in 100 g of fruit
Acerola cherries	1,678 mg
Black currants	181 mg
Guava	228 mg
Kiwifruit	105 mg
Pineapple	56 mg
Strawberries	59 mg

17

Which quantity of fruit contains an amount of vitamin C closest to the combined amount of vitamin C in 50 g of acerola cherries and 150 g of kiwifruit?

A) 2,000 g of black currants

B) 800 g of guava

C) 1,800 g of pineapple

D) 600 g of strawberries

18

A fruit salad was prepared containing 100 g of acerola cherries, 100 g of kiwifruit, 300 g of pineapple, and 200 g of strawberries. What is the total amount of vitamin C, in grams, that is contained in the listed fruits?

A) 0.7 g

B) 2.069 g

C) 700 g

D) 2,069 g

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19

A quality-control specialist for an electronics manufacturer estimates that 0.25% of the televisions produced each day by her company are defective. If the manufacturer produces an average of 450 televisions each day, which of the following is the best estimate of the total number of defective televisions produced in 30 working days?

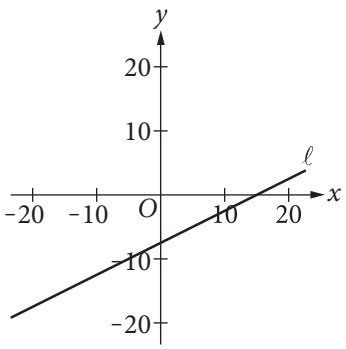
A) 1

B) 34

C) 113

D) 3,375

20



Line ℓ is shown on the xy-plane above. If the corresponding equation for line ℓ is $y = ax + b$, where a and b are constants, which set of inequalities is true about a and b?

A) $\begin{cases} 0 < a < 1 \\ b < 1 \end{cases}$

B) $\begin{cases} -1 < a < 0 \\ b > -10 \end{cases}$

C) $\begin{cases} a < 0 \\ b < 1 \end{cases}$

D) $\begin{cases} a > 0 \\ b > 10 \end{cases}$

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CONTINUE

21

Mr. LePage spent $25,000 to buy a new truck for his construction business. He estimated the value of the truck after each of the next 5 years, as shown in the table below.

Truck Value after Each Year of Ownership

Year (x)	Truck Value (y)
1	$22,000
2	$19,000
3	$16,000
4	$13,000
5	$10,000

If the line passing through the points defined by the values in the table is graphed in the xy-plane, which of the following is the best interpretation of the y-intercept in the context of the problem?

A) The number of years for which the value of the truck will decrease

B) The amount that the value of the truck is decreasing each year

C) The value of the truck after the sixth year of ownership

D) The value of the truck when it was new

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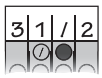
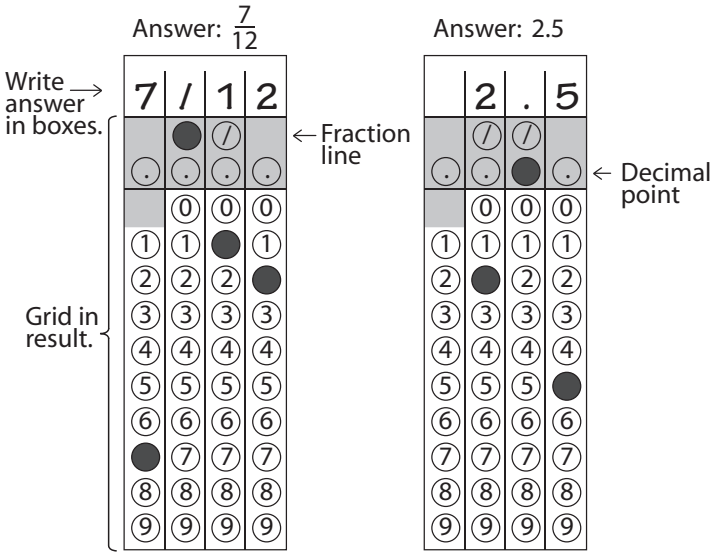
CONTINUE

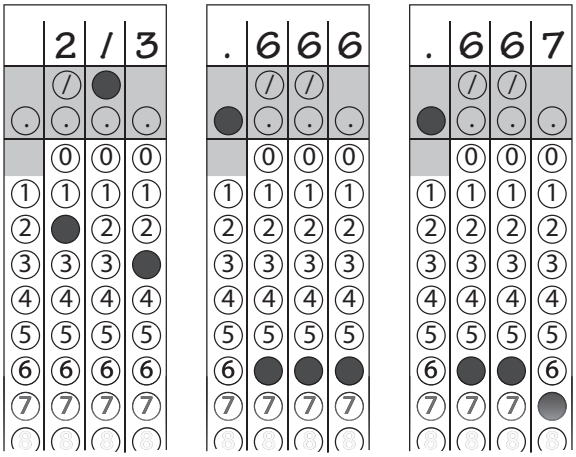
DIRECTIONS

For questions 22-25, solve the problem and enter your answer in the grid, as described below, on the answer sheet.

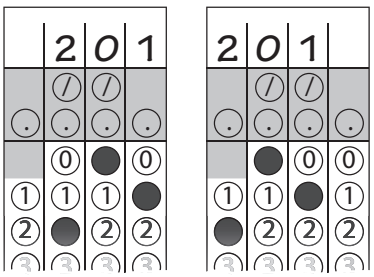
1. Although not required, it is suggested that you write your answer in the boxes at the top of the columns to help you fill in the circles accurately. You will receive credit only if the circles are filled in correctly.
2. Mark no more than one circle in any column.
3. No question has a negative answer.
4. Some problems may have more than one correct answer. In such cases, grid only one answer.
5. **Mixed numbers** such as $3\frac{1}{2}$ must be gridded as 3.5 or 7/2. (If  is entered into the grid, it will be interpreted as $\frac{31}{2}$, not $3\frac{1}{2}$.)
6. **Decimal answers:** 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.



Acceptable ways to grid $\frac{2}{3}$ are:



Answer: 201 – either position is correct



NOTE: You may start your answers in any column, space permitting. Columns you don't need to use should be left blank.

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CONTINUE

22

The solution to the system of equations below is (x, y).

$$5x - 6y = 2.7$$
$$10x + 7y = 1.6$$

What is the value of x ?

23

A dinner was held to raise money for a children's museum. A ticket for one person cost $200 and a ticket for a couple (two people) cost $350. A total of 130 people attended the dinner, and the ticket sales total was $24,000. What is the total number of tickets that were sold?

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CONTINUE

Questions 24 and 25 refer to the following information.

The United States Senate first convened in the year 1789. From 1789 through 2013, a total of 44 women served as US senators. The partially completed table below shows the number of women senators by political party and geographical region.

Number of Women US Senators through 2013

		Political party		
		Democratic	Republican	Total
Geographical region	Midwest		7	
	Northeast	4		8
	South		3	
	West	6		7
	Total			44

24

What is the total number of women from the Democratic Party who served as US senators from 1789 through 2013 ?

25

From 1789 through 2013, of the women from only the Democratic Party who served as US senators, 34.5% have been from the South region. What is the total number of Democratic and Republican women US senators who represented the Midwest in this time period?

STOP

If you finish before time is called, you may check your work on this section only.
Do not turn to any other section.

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No Test Material On This Page