Math Test – No Calculator

20 MINUTES, 13 QUESTIONS

Turn to Section 3 of your answer sheet to answer the questions in this section.

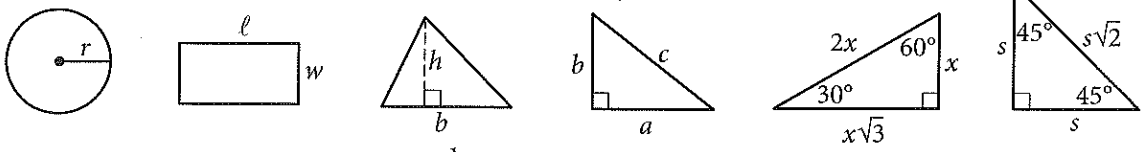
DIRECTIONS

For questions 1-10, solve each problem, choose the best answer from the choices provided, and fill in the corresponding circle on your answer sheet. **For questions 11-13**, solve the problem and enter your answer in the grid on the answer sheet. Please refer to the directions before question 11 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 not permitted**.
2. All variables and expressions used represent real numbers unless otherwise indicated.
3. Figures provided in this test are drawn to scale unless otherwise indicated.
4. All figures lie in a plane unless otherwise indicated.
5. Unless otherwise indicated, the domain of a given function f is the set of all real numbers x for which $f(x)$ is a real number.

REFERENCE



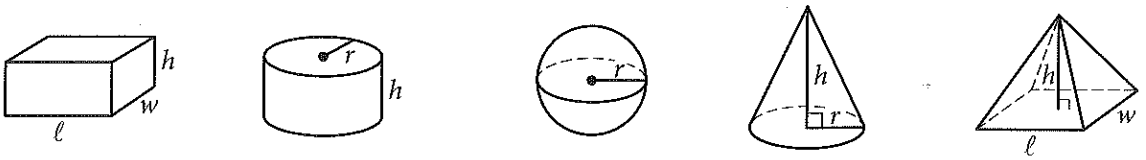
$A = \pi r^2$
$C = 2\pi r$

$A = \ell w$

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

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

Special Right Triangles



$V = \ell wh$

$V = \pi r^2 h$

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

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

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

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

CONTINUE

1

$$0,\ 1\frac{1}{2},\ 3,\ 4\frac{1}{2},\ x,\ \ldots$$

In the sequence above, the first term is 0. Each term after the first is $\frac{3}{2}$ greater than the term before it.

What is the value of x ?

A) 7

B) 6

C) $5\frac{1}{2}$

D) 5

2

$$\frac{4x}{5} = 20$$

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

A) 25

B) 24

C) 16

D) 15

3

Angela is playing a video game. In this game, players can score points only by collecting coins and stars. Each coin is worth c points, and each star is worth s points.

- The first time she played, Angela scored 700 points. She collected 20 coins and 10 stars.
- The second time she played, Angela scored 850 points. She collected 25 coins and 12 stars.

Which system of equations can be used to correctly determine the values of c and s ?

A) $10c + 20s = 700$
$12c + 25s = 850$

B) $20c + 10s = 700$
$25c + 12s = 850$

C) $20c + 700s = 10$
$25c + 850s = 12$

D) $700c + 20s = 10$
$850c + 25s = 12$

4

$$3x + y = 24$$
$$x^2 + y = 64$$

Which of the following ordered pairs (x, y) is a solution to the system of equations above?

A) $(0, 24)$

B) $(0, 64)$

C) $(8, 0)$

D) $(-8, 0)$

CONTINUE

5

Marisol drove 3 hours from City A to City B. The equation below estimates the distance d, in miles, Marisol traveled after driving for t hours.

$$d = 45t$$

Which of the following does 45 represent in the equation?

A) Marisol took 45 trips from City A to City B.

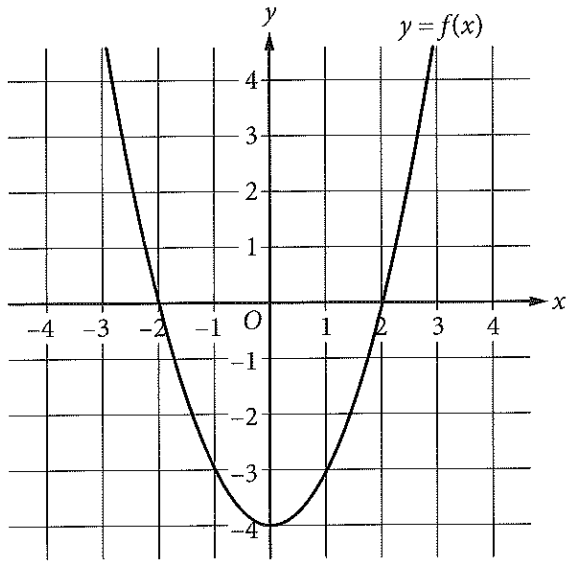
B) The distance between City A and City B is 45 miles.

C) Marisol drove at an average speed of about 45 miles per hour.

D) It took Marisol 45 hours to drive from City A to City B.

6

The graph of a function f is shown in the xy-plane below.



Which of the following equations could represent f?

A) $f(x) = x^2 - 4$

B) $f(x) = x^2 - 2$

C) $f(x) = x^2 + 2$

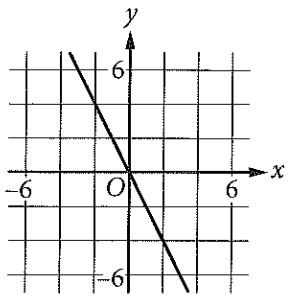
D) $f(x) = x^2 + 4$

CONTINUE

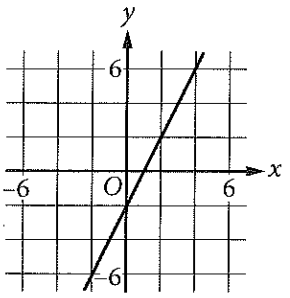
7

Which of the following is the graph of $y = \frac{1}{2}x - 2$ in the xy-plane?

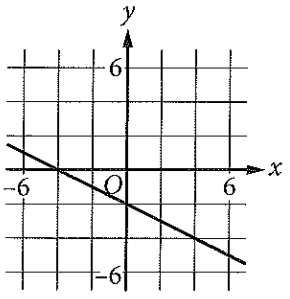
A)



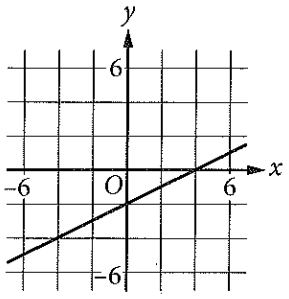
B)



C)



D)



8

$$y = 2x - 3$$
$$3y = 5x$$

In the solution to the system of equations above, what is the value of y ?

A) -15

B) -9

C) 9

D) 15

15

45

$3(2x-3) = 5x$

$6x - 9 = 5x$

$x = 9$

CONTINUE

9

$$(2h - 3) + (h^2 + 5h + 8)$$

Which of the following expressions is equivalent to the expression shown above?

A) $h^2 + 3h + 5$

B) $h^2 - 3h - 11$

C) $-h^2 + 7h + 5$

D) $-h^2 - 3h - 11$

$-h^2 + 7h + 5$

10

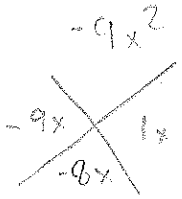
Which of the following is equivalent to the expression $x^2 - 8x - 9$?

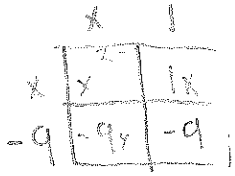
A) $(x - 3)^2$

B) $(x - 3)(x - 6)$

C) $(x + 9)(x - 1)$

D) $(x - 9)(x + 1)$

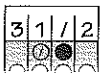


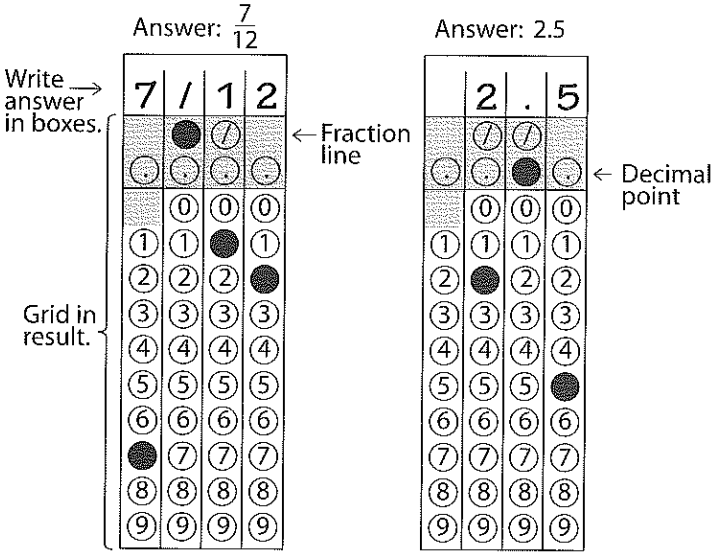


$(x+1)(x-9)$

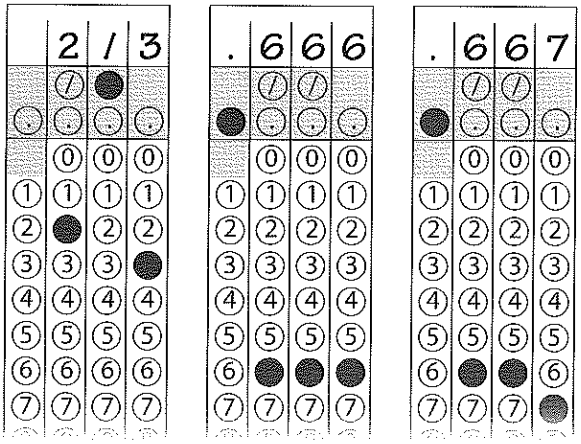
DIRECTIONS

For questions 11-13, solve the problem and enter your answer in the grid, as described below, on the answer sheet.

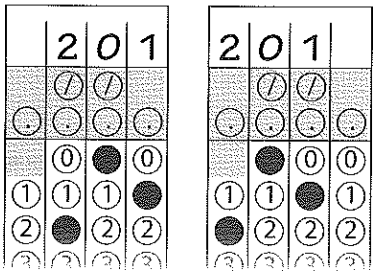
1. Although not required, it is suggested that you write your answer in the boxes at the top of the columns to help you fill in the circles accurately. You will receive credit only if the circles are filled in correctly.
2. Mark no more than one circle in any column.
3. No question has a negative answer.
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.

CONTINUE

11

$$47 = 4z - 11$$

What is the value of z that satisfies the equation above?

12

Line s is drawn in the xy-plane and has an equation $3y - 6x = 9$. Line t is parallel to line s. What is the slope of line t ?

13

$$6 = x(1 + 2x)$$

If x is a solution to the equation above and $x > 0$, what is the value of x ?

STOP

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

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

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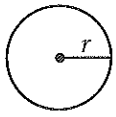
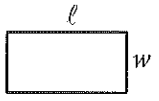
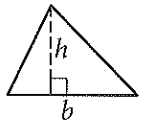
REFERENCE



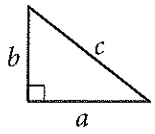
$A = \pi r^2$
$C = 2\pi r$



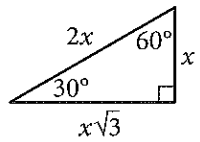
$A = \ell w$

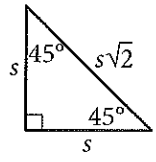


$A = \frac{1}{2}bh$

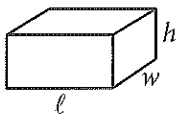


$c^2 = a^2 + b^2$

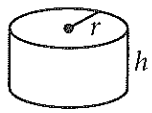




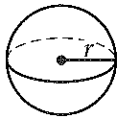
Special Right Triangles



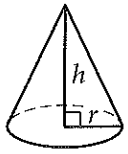
$V = \ell wh$



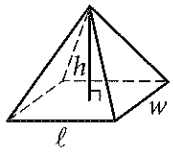
$V = \pi r^2 h$



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



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



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

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

CONTINUE

1

On a floor plan for Rosedale Middle School, 1 inch represents 10 feet. If Sarah's classroom is 2 inches by 3 inches on the floor plan, what are the actual dimensions of her classroom?

A) 20 feet by 30 feet

B) 40 feet by 60 feet

C) 200 feet by 300 feet

D) 20 yards by 30 yards

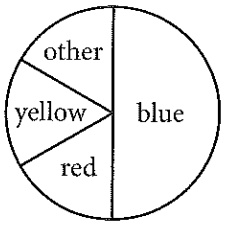
2

Color Survey

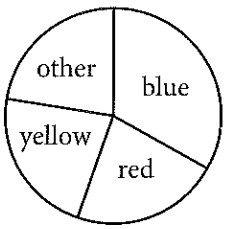
Favorite color	Number of students
blue	8
red	6
yellow	6
other	4

Each of the 24 children in Mr. Ishibashi's kindergarten class was asked, "What is your favorite color?" The results are shown in the table above. Which of the following circle graphs represents the information in the table?

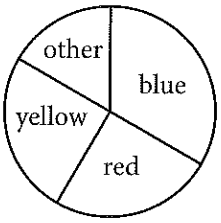
A)



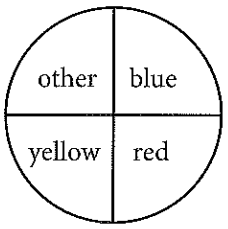
B)



C)



D)



CONTINUE

3

For a school fund-raiser, 10 students sold a total of 90 boxes of cookies. Which of the following can be calculated from this information?

A) The average number of boxes sold per student

B) The median number of boxes sold per student

C) The greatest number of boxes sold by one student

D) The least number of boxes sold by one student

4

Cathy has n CDs. Gerry has 3 more than twice the number of CDs that Cathy has. In terms of n, how many CDs does Gerry have?

A) $3n - 2$

B) $3n + 2$

C) $2n - 3$

D) $2n + 3$

5

A librarian has 43 books to distribute to a group of children. If he gives each child 2 books, he will have 7 books left over. How many children are in the group?

A) 15

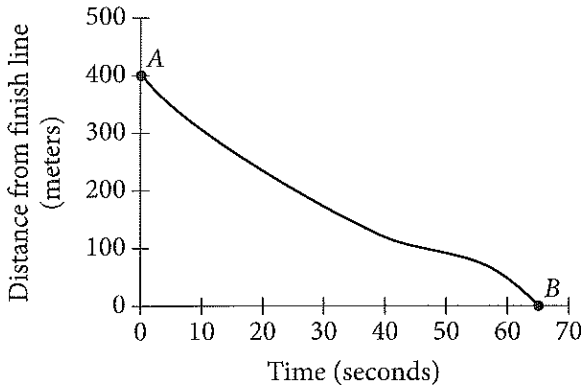
B) 18

C) 25

D) 29

6

The graph below shows the relationship between time, in seconds, and distance from the finish line, in meters, for Juan while he competed in a race.



Which of the following is the correct interpretation of point B in the context of this problem?

A) At 65 seconds, Juan was at the finish line.

B) Juan's average speed was slightly over 6 meters per second.

C) Juan's fastest speed during the race was approximately 7 meters per second.

D) Juan was 400 meters away from the finish line when the time was equal to zero.

CONTINUE

7

During migration, a gray whale swam 5,040 miles. The whale swam a total of 672 miles during its first 7 days of migration. If the whale swam at the same rate during the entire migration, how many miles did it swim during the first 30 days of migration?

A) 168
B) 695
C) 1,176
D) 2,880

8

If $3x - 6 = 21$, what is the value of $x - 2$?

A) 3
B) 5
C) 7
D) 11

Questions 9 and 10 refer to the following information.

A tree is planted and is expected to grow according to the model below, where t is the number of years since the tree was planted and H is the height of the tree, in feet.

$$H = 3t + 5$$
$$0 \leq H \leq 100$$

9

How many years after the tree is planted does the model predict the tree will reach a height of 65 feet?

A) 200
B) 23
C) 20
D) 17

10

According to the model, which of the following statements is true?

A) The tree was 3 feet tall when planted.
B) The tree is expected to increase in height at a rate of 3 feet per year.
C) The tree is expected to increase in height at a rate of 1 foot every 3 years.
D) The tree is expected to reach a maximum height of 3 feet.

CONTINUE

11

Geoff earns $9.25 per hour before taxes, and he works 40 hours per week. Geoff's employer withholds (takes out) 10.65% of Geoff's income for taxes. What are Geoff's total weekly earnings after taxes are withheld?

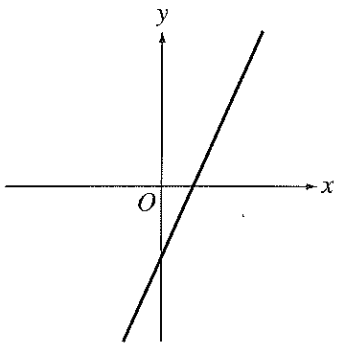
A) $39.41

B) $59.90

C) $330.60

D) $370.00

12



Which of the following could be an equation of the line graphed in the xy-plane above?

A) $y = 2x - 6$

B) $y = 2x + 3$

C) $y = -2x - 6$

D) $y = -2x + 3$

13

In the equation below, c is a constant.

$$\sqrt{(x+c)^2} = 25$$

For which of the following values of c is $x = -2$ a solution to the equation?

A) -7

B) -3

C) 2

D) 10

14

A certain forest is 253 acres. To estimate the number of trees in the forest, a ranger randomly selects 5 different 1-acre parcels in the forest and determines the number of trees in each parcel. The numbers of trees in the sample acres are 51, 59, 45, 52, and 73. Based on the mean of the sample, which of the following ranges contains the best estimate for the number of trees in the entire forest?

A) 11,000 to 12,000

B) 12,500 to 13,500

C) 13,500 to 14,500

D) 18,000 to 19,000

CONTINUE

15

This year, a town has a budget of $1,000,000. Next year, the budget will increase by 2.5%. What will the town's budget be next year?

A) $1,025,000

B) $1,250,000

C) $2,050,000

D) $2,500,000

16

The table below shows the results of a survey of high school students who plan to attend college. It shows whether the students plan to attend a 2-year college or a 4-year college and whether the students plan to attend an in-state or an out-of-state college.

College Planning Survey

	2-year college	4-year college	Total
In-state	18	16	34
Out-of-state	4	12	16
Total	22	28	50

What percent of the students surveyed plan to attend an out-of-state 4-year college?

A) 12%

B) 24%

C) 43%

D) 75%

CONTINUE

15

This year, a town has a budget of $1,000,000. Next year, the budget will increase by 2.5%. What will the town's budget be next year?

A) $1,025,000

B) $1,250,000

C) $2,050,000

D) $2,500,000

16

The table below shows the results of a survey of high school students who plan to attend college. It shows whether the students plan to attend a 2-year college or a 4-year college and whether the students plan to attend an in-state or an out-of-state college.

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	2-year college	4-year college	Total
In-state	18	16	34
Out-of-state	4	12	16
Total	22	28	50

What percent of the students surveyed plan to attend an out-of-state 4-year college?

A) 12%

B) 24%

C) 43%

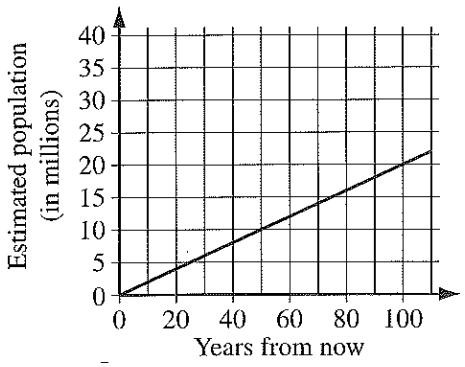
D) 75%

CONTINUE

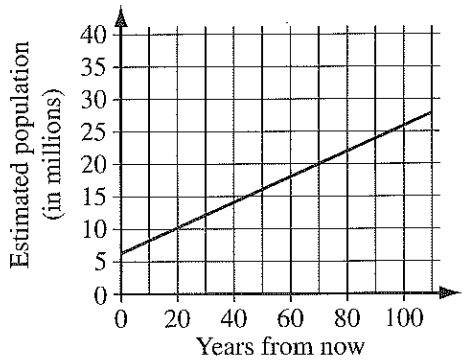
17

The current population of a country is 6.0 million people. It is estimated that the population of the country will double every 30 years. Of the following, which graph best represents the country's estimated population growth?

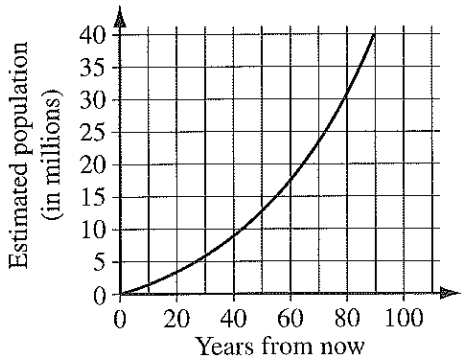
A)



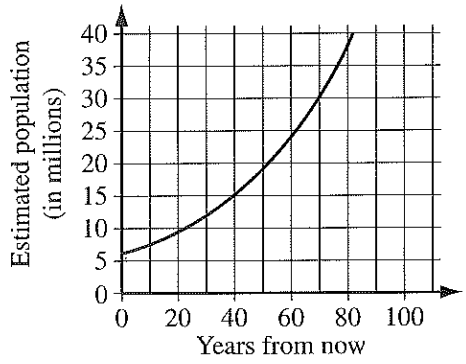
B)



C)



D)



CONTINUE

18

Megan played 5 Sudoku games that were at medium difficulty level. The mean completion time per game was 5.9 minutes. She completed a sixth Sudoku game in 2 minutes and 54 seconds. Which of the following statements must be true about the changes between Megan's completion times for the 6 games and her completion times for the 5 games?

A) The mode of the 6 completion times decreased.

B) The median of the 6 completion times remained the same.

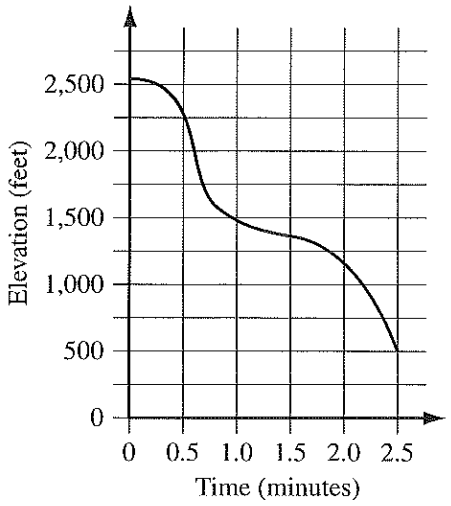
C) The mean completion time per game for the 6 games increased by 2.9 minutes.

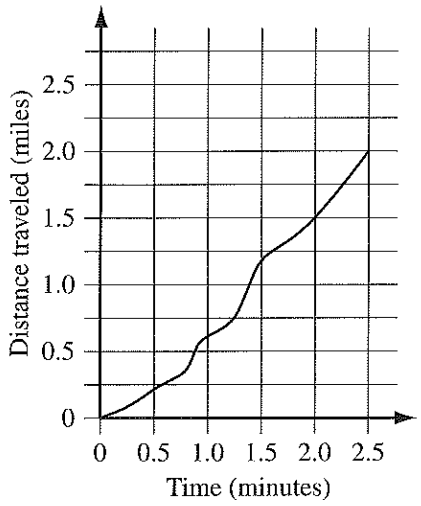
D) The mean completion time per game for the 6 games decreased by 30 seconds.

CONTINUE

19

Salma completed a downhill ski race. The graphs below represent her elevation over time and her distance traveled over time as she raced down the mountain.





Which of the following is closest to the total distance Salma had traveled when she reached an elevation of 1,500 feet?

A) 0.6 mile

B) 0.9 mile

C) 1.1 miles

D) 1.5 miles

CONTINUE

20

A gym offers only a cycling class and a yoga class at the same time on Saturday mornings. The fitness director at the gym kept track of the number of males and females in these two classes last Saturday morning. The data are displayed in the table below.

Saturday Morning Classes

	Males	Females
Yoga	18	23
Cycling	21	17

To the nearest percent, what percent of the people who attended classes that morning were males in the yoga class?

A) 18%

B) 23%

C) 44%

D) 46%

21

Gold is often used with other metals, such as copper and zinc, to make jewelry. Approximately 58% of the mass of a certain 40-gram necklace is gold. The density of gold is 19.3 grams per cubic centimeter. What is the volume of gold, to the nearest tenth of a cubic centimeter, in the necklace?

A) 0.8

B) 1.2

C) 4.5

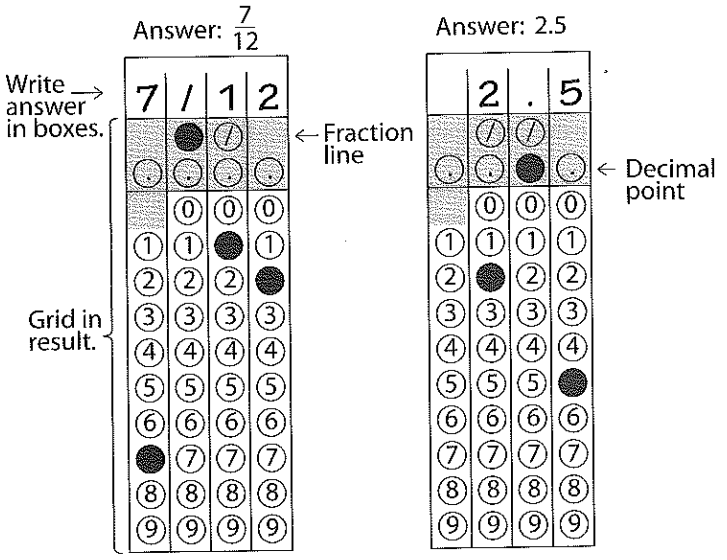
D) 23.2

CONTINUE

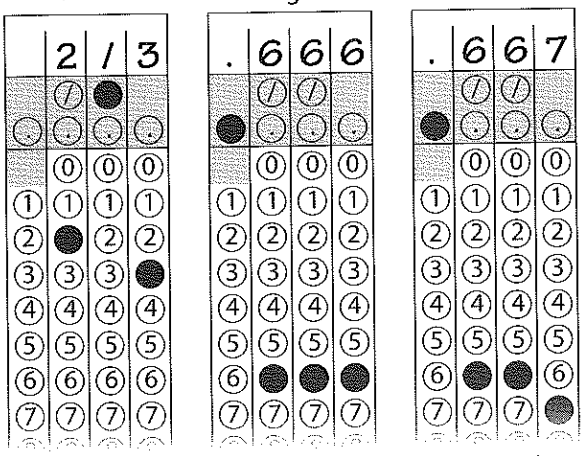
DIRECTIONS

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

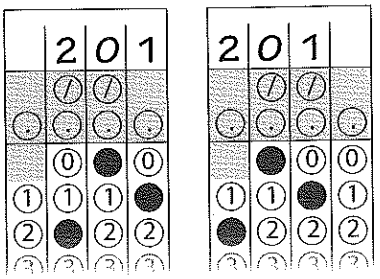
1. Although not required, it is suggested that you write your answer in the boxes at the top of the columns to help you fill in the circles accurately. You will receive credit only if the circles are filled in correctly.
2. Mark no more than one circle in any column.
3. No question has a negative answer.
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.

CONTINUE

22

Angelo grows vegetables and sells them at a farmers' market. The price of 2 cucumbers and 1 pepper is \$3.15, and the price of 3 cucumbers and 2 peppers is \$5.35. Based on this pricing, what would be the price, in dollars, of 4 cucumbers and 3 peppers? (Disregard the \$ sign when gridding your answer. For example, if your answer is \$1.37, grid 1.37)

$2c + 1p = 3.15$

$3c + 2p = 5.35$

$4c + 3p = 7.55$

23

$$2y - 2x = 8$$
$$y + 6x = 11$$

If (x, y) is the solution to the system of equations above, what is the value of $7y$?

$y = 11 - 6x$ 35

$y = 5$

$2(11 - 6x) - 2y = 8$

$22 - 12x - 2y = 8$

$-14x = -14$

$x = 1$

Questions 24 and 25 refer to the following information.

A random sample of 400 town voters were asked if they plan to vote for Candidate A or Candidate B for mayor. The results were sorted by gender and are shown in the table below.

	Plan to vote for Candidate A	Plan to vote for Candidate B
Female	202	20
Male	34	144

24

The town has a total of 6000 voters. Based on the table, what is the best estimate of the number of voters who plan to vote for Candidate A?

3546

25

The percentage of voters in the sample who answered that they are both female and planned to vote for Candidate B is p%. What is the value of p ?

STOP

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