

★ 9PTRWM

# Alaska

Comprehensive System of Student Assessment

Standards Based Assessments

Grade 9

Reading ★ Writing ★ Mathematics  
Practice Test Book



Spring 2012

Alaska Department of Education & Early Development

Name:

# MATHEMATICS

You may use the Mathematics Reference Sheet any time during the test.

1. The measure of an angle is  $75^\circ$ . What is the measure of its complementary angle?

- A  $15^\circ$
  - B  $25^\circ$
  - C  $75^\circ$
  - D  $105^\circ$
- 

2. The first six terms of a sequence are shown in the table below.

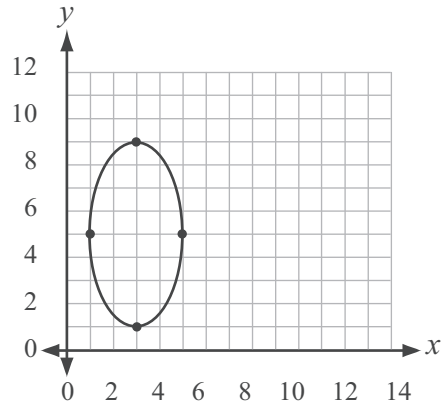
4	5	7	11	19	35	?
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What is the next term in the sequence?

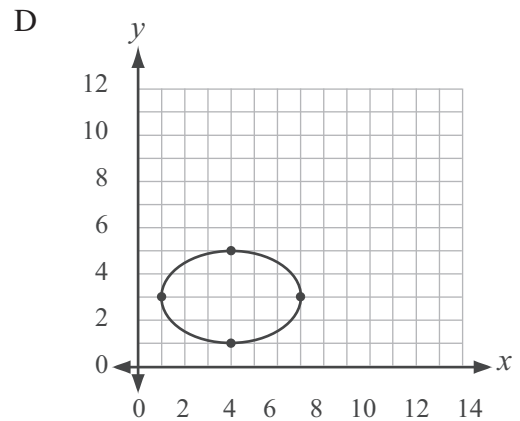
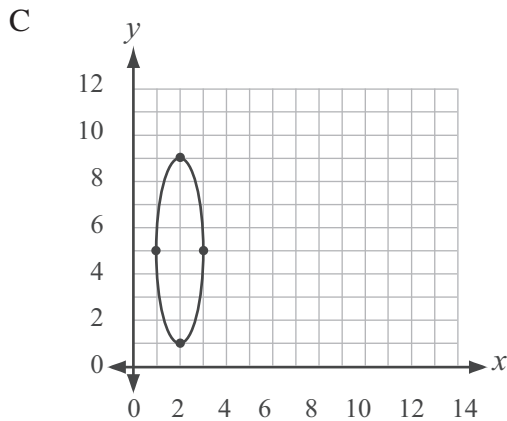
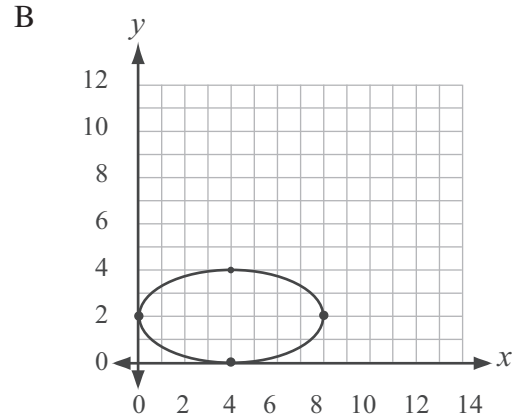
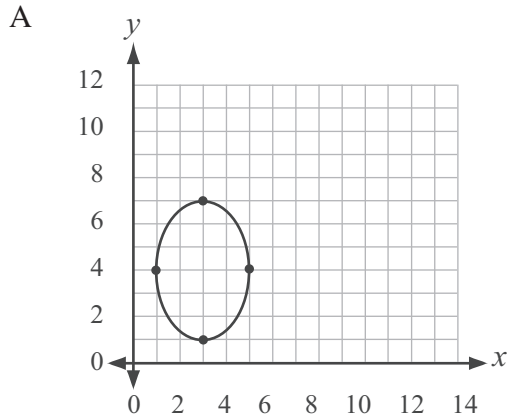
- A 51
- B 53
- C 67
- D 70

# MATHEMATICS

3. The diagram below shows a swimming pool.



Which diagram shows another swimming pool congruent to the first swimming pool?



## MATHEMATICS

4. The number of passengers on a bus for 7 consecutive days is shown below.

35, 35, 28, 30, 35, 32, 34

Which **best** shows the number of passengers **most often** on the bus?

- A mean
  - B median
  - C mode
  - D range
- 

5. Corey used the following table when making iced tea.

**Iced Tea Ingredients**

Cups of Water	Tea Bags
2	5
3	7
6	13
7	15
9	19
10	21

Which equation shows the relationship between the number of cups of water ( $x$ ) and the number of tea bags needed ( $y$ )?

- A  $y = 2x + 1$
- B  $y = 2x + 5$
- C  $y = x + 2$
- D  $y = x + 3$

## MATHEMATICS

6. The expression below shows how many blocks Alma uses to build a planter.

$$5^3 - 3^3$$

How many blocks does Alma use to build the planter?

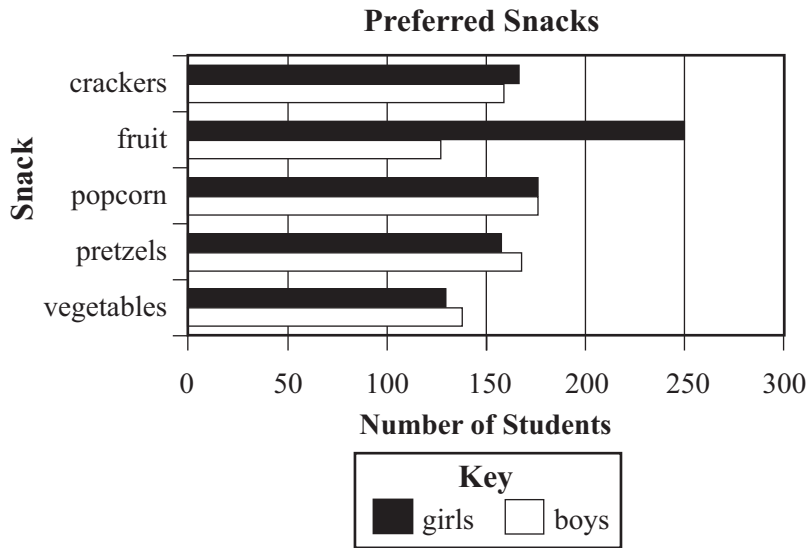
- A 6
  - B 8
  - C 98
  - D 116
- 

7. What is the slope of the line whose equation is  $-3x + y = 12$ ?

- A -4
- B -3
- C 3
- D 12

# MATHEMATICS

8. Amy asked students to choose one preferred snack. She displayed the results on the graph shown.



Which snack did the **greatest** number of students prefer?

- A fruit
- B popcorn
- C pretzels
- D vegetables

9. The equation below represents the relationship between the rate at which snow fell and the total number of inches of snow that fell during a snowfall.

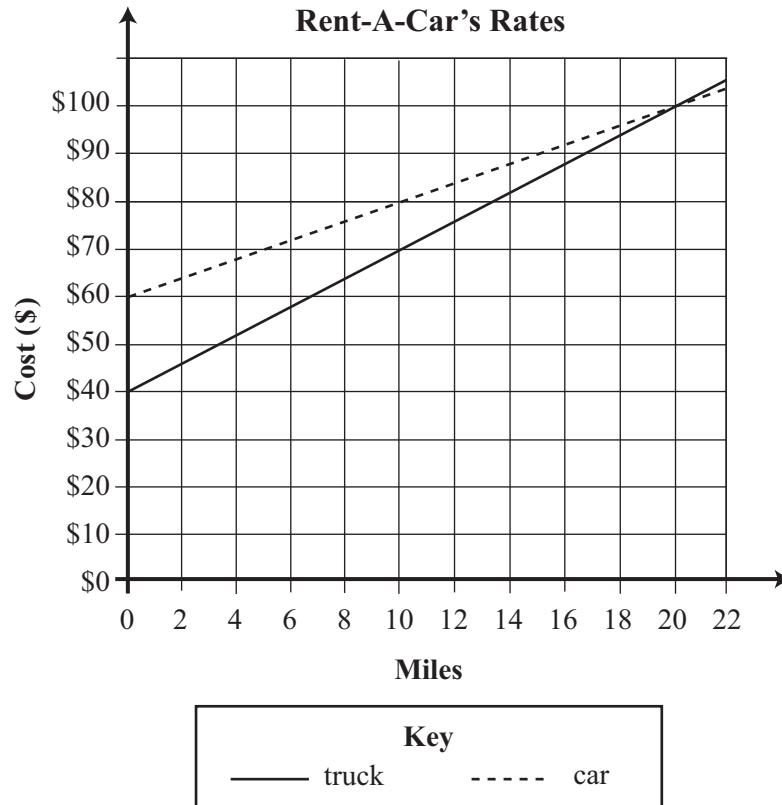
$$rh = t$$

The snow fell at a rate of  $r$  inches per hour for  $h$  hours. A total of  $t$  inches of snow fell during the snowfall. Which equation shows how to find the number of hours,  $h$ , the snow fell?

- A  $h = r + t$
- B  $h = t \times r$
- C  $h = t \div r$
- D  $h = r \div t$

# MATHEMATICS

10. The graph below shows Rent-A-Car's rates for cars and trucks.

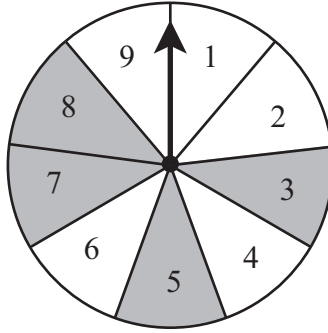


The base price to rent a car is \$60, and there is an additional cost of \$2 per mile. The base price to rent a truck is \$40, and there is an additional cost of \$3 per mile. At how many miles will the cost be the same to rent either vehicle?

- A 10
- B 20
- C 22
- D 100

## MATHEMATICS

11. Crystal is playing a game with the spinner shown below. It is Crystal's turn to spin the arrow.



What is the probability the arrow will land on a number that is both odd and shaded?

- A  $\frac{20}{81}$
- B  $\frac{1}{3}$
- C  $\frac{4}{9}$
- D  $\frac{5}{9}$
- 
12. The amount of interest ( $I$ ) Karl will earn on the amount of principal ( $p$ ) he has in his bank account is found by using the formula  $I = prt$ , with  $r$  representing the rate of interest and  $t$  the time the money will be in the account. Sheena has twice the amount of principal as Karl in a bank account at the same rate for the same amount of time. How does the interest earned on Sheena's principal compare to the interest that will be earned on Karl's principal?
- A The interest Sheena earns will be  $\frac{1}{2}$  as much as Karl earns.
- B The interest Sheena earns will be 8 times as much as Karl earns.
- C The interest Sheena earns will be  $\frac{1}{8}$  as much as Karl earns.
- D The interest Sheena earns will be 2 times as much as Karl earns.



## MATHEMATICS

13. The table below shows the prices a company charges for basketball trophies.

**Basketball Trophy Prices**

<b>Number of Letters (<math>x</math>)</b>	<b>Price (<math>y</math>)</b>
0	\$3.90
1	\$4.00
2	\$4.10
3	\$4.20
4	\$4.30

Each price depends on the number of letters ( $x$ ) to be engraved. Which equation models the price ( $y$ ) of a trophy with  $x$  letters?

- A  $y = 3.90 + x$
- B  $y = 3.90x$
- C  $y = 3.90 + 0.10x$
- D  $y = 3.90 + 10x$

## MATHEMATICS

14. The total sales for Monica's store for the first year was \$225,000. Monica's profit was  $\frac{2}{5}$  of the total sales. What was Monica's profit for the first year?
- A \$ 22,500
  - B \$ 45,000
  - C \$ 90,000
  - D \$135,000
- 

15. The floor of an art gallery is a square with an area of 62,500 square feet. How can the length of one side of the floor be found?
- A  $62,500^2$
  - B  $\sqrt{62,500}$
  - C  $62,500 \cdot 2$
  - D  $62,500 \div 2$

**Turn to page 24 in your answer booklet to complete question 16.**

## MATHEMATICS

17. A class of 29 ninth graders is going on a field trip. The field trip costs \$19.95 per person. Mr. Brubaker estimates the trip will cost \$600. Which statement is true about Mr. Brubaker's estimate?
- A His estimate is greater than the actual cost by about \$21.
  - B His estimate is less than the actual cost by about \$21.
  - C His estimate is greater than the actual cost by about \$1.
  - D His estimate is less than the actual cost by about \$1.
- 

18. Which operation should be performed first to evaluate the expression  $[12 - 5(4x)^2] \div 2$ ?
- A  $12 - 5$
  - B  $5(4x)$
  - C  $(4x)^2$
  - D  $(4x)^2 \div 2$
- 

19. Max bought a 100-page journal and writes 1 page per day. Pat bought a 200-page journal and writes 3 pages per day. The equation below can be solved to find the number of days ( $d$ ) until they will have the same number of pages left in their journals.

$$-d + 100 = -3d + 200$$

In how many days ( $d$ ) will Max and Pat have the same number of pages left in their journals?

- A 25
- B 50
- C 75
- D 100

## MATHEMATICS

20. Fern has a pie in the shape of a circle. She divides it into 3 equal sections. What is the central angle measure of each section of Fern's pie?

A  $33^\circ$   
B  $60^\circ$   
C  $100^\circ$   
D  $120^\circ$

---

21. Which expression shows another way to write  $(4^3)^3$ ?

A  $4^3 - 3$   
B  $4^3 \div 3$   
C  $4^3 + 3$   
D  $4^3 \times 3$

---

22. The system of equations below shows the rental costs ( $y$ ), in dollars, for renting a kayak  $x$  hours from two different rental companies.

$$y = 25x + 250$$
$$y = 50x + 150$$

For what number of hours will the rental cost be the same for both companies?

A 4  
B 5  
C 10  
D 16

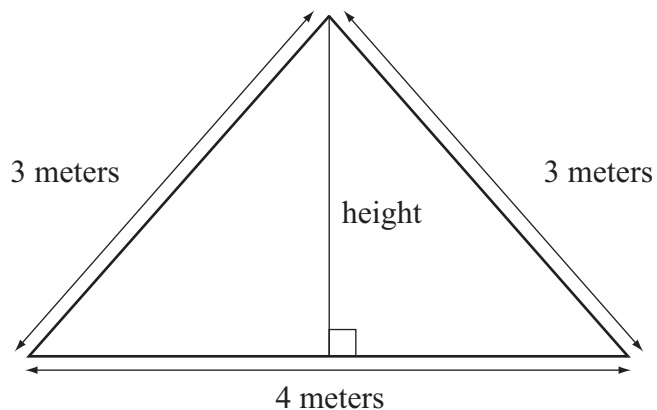
## MATHEMATICS

23. At Thompson Pass, 12 inches of snow fell during a 16-hour period. At this rate how much snow would fall in 24 hours?
- A 8 inches
  - B 18 inches
  - C 28 inches
  - D 32 inches
- 

24. What kind of number results from simplifying  $\frac{9\pi}{6\pi}$ ?
- A a whole number
  - B a repeating decimal
  - C a terminating decimal
  - D a non-repeating decimal that does not terminate

## MATHEMATICS

25. The diagram below represents the roof of a house.



What is the height of the roof in meters?

- A  $\sqrt{2}$  meters
- B  $\sqrt{5}$  meters
- C  $\sqrt{7}$  meters
- D  $\sqrt{13}$  meters

- 
26. The density ( $D$ ) of an object can be calculated using the formula below, where  $m$  is the mass of the object and  $V$  is its volume.

$$D = \frac{m}{V}$$

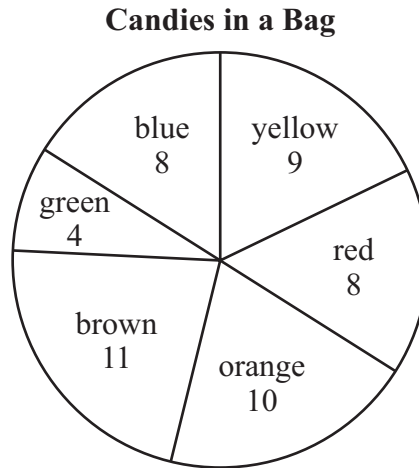
Which shows this equation solved for  $m$ ?

- A  $m = D + V$
- B  $m = \frac{D}{V}$
- C  $m = D - V$
- D  $m = DV$

## MATHEMATICS

27. The figure of a horse is 10 feet from the center of a merry-go-round. The figure of a lion is 20 feet from the center. What is the relationship between the distances the two figures travel during one revolution?
- A The horse and lion travel the same distance.
  - B The horse travels twice as far as the lion.
  - C The lion travels twice as far as the horse.
  - D The lion travels 4 times as far as the horse.
- 

28. The circle graph below shows the number of each colored candy in a bag.



Martin picks a candy out of the bag, records the color, and returns the candy to the bag. He does this 20 times. How many times should Martin expect to pick an orange candy?

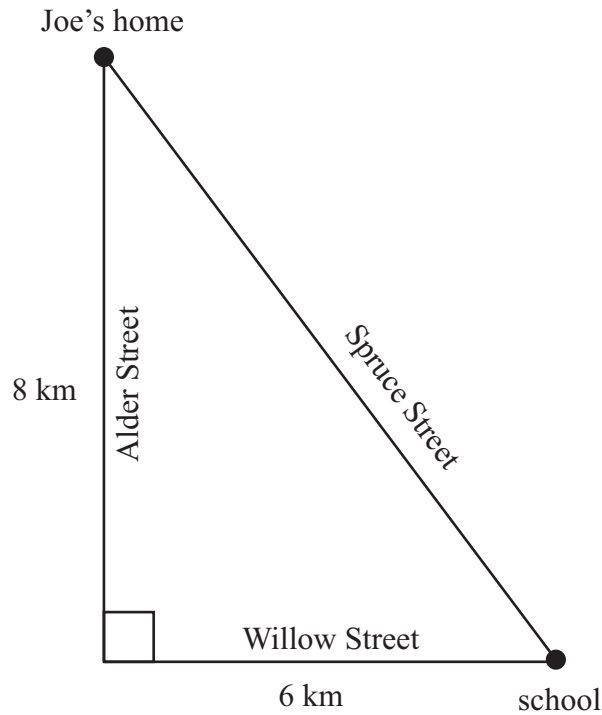
- A 2
- B 3
- C 4
- D 10

## MATHEMATICS

29. Rita bought yogurt in a cylinder-shaped container. The diameter of the container is 6 centimeters and the height is 5 centimeters. What is the volume of the yogurt container? (Use 3.14 for  $\pi$ .)

- A 94.2  $\text{cm}^3$
  - B 141.3  $\text{cm}^3$
  - C 471  $\text{cm}^3$
  - D 565.2  $\text{cm}^3$
- 

30. The diagram below shows the streets from Joe's home to school.



Joe is going to bike to school along Spruce Street. What is the distance Joe will bike?

- A 8 km
- B 10 km
- C 28 km
- D 50 km



## MATHEMATICS

31. The table below shows information about invitations Terry sent to friends.

**Terry's Invitations**

Invitation Color	Number Sent
red	10
yellow	10
blue	15
green	15

What is the probability that a friend received a yellow invitation?

- A  $\frac{1}{50}$
  - B  $\frac{1}{10}$
  - C  $\frac{1}{5}$
  - D  $\frac{1}{4}$
- 

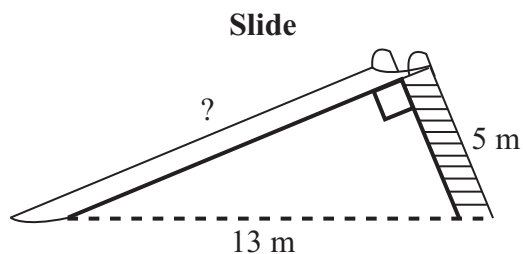
32. Brianna fixes snow machines. One day she spent 120 minutes on the first snow machine, 30 minutes on the second, and 105 minutes on the third. She estimates that it took her an average of 90 minutes to fix 1 snow machine. Which **best** describes Brianna's estimate?
- A It is an underestimate by more than 10 minutes.
  - B It is an underestimate by less than 10 minutes.
  - C It is an overestimate by less than 10 minutes.
  - D It is an overestimate by more than 10 minutes.

## MATHEMATICS

33. Brenda has two storage boxes with a combined volume of  $2^3 \times 2$  cubic feet. What is the combined volume in cubic feet?
- A 12 cubic feet
  - B 16 cubic feet
  - C 32 cubic feet
  - D 64 cubic feet
- 

34. In evaluating the expression  $(32 + 8 \times 2)^3 \div 4$ , which shows the expression after the first step has been performed?
- A  $(40 \times 2)^3 \div 4$
  - B  $(32 + 16)^3 \div 4$
  - C  $(32 + 8 \times 8) \div 4$
  - D  $(32 + 8 \times 2)$
- 

35. A right angle is made where the top of a ladder meets the top of a slide as shown in the picture below.



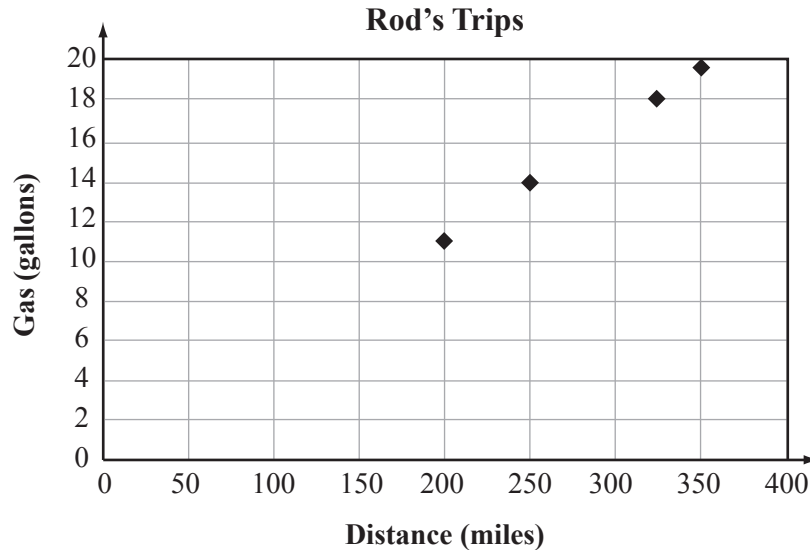
What is the length of the slide?

- A  $\sqrt{8}$  meters
- B 8 meters
- C 12 meters
- D  $\sqrt{194}$  meters

## MATHEMATICS

36. Shannon read that the latest model of a car made in Europe travels at speeds up to 120 kilometers per hour. Approximately how many miles per hour is 120 kilometers per hour?
- A 74  
B 119  
C 121  
D 194

- 
37. Rod made the scatter plot below to show the number of miles he flew in his plane and the number of gallons of gas he used during several trips.



Based on the information in the scatter plot, about how many gallons of gas can Rod expect to use for a 275-mile long trip?

- A 13  
B 16  
C 18  
D 20

## MATHEMATICS

38. Ronnie is trying to solve the equation below.

$$\sqrt{x} = 81$$

What should Ronnie do first to find the value of  $x$ ?

- A divide 81 by 2
  - B square 81
  - C find the square root of 81
  - D multiply 81 by 2
- 

39. The manager of a restaurant collected data on the number of servings of fish ordered during a week as shown in the table below.

**Fish Servings Ordered**

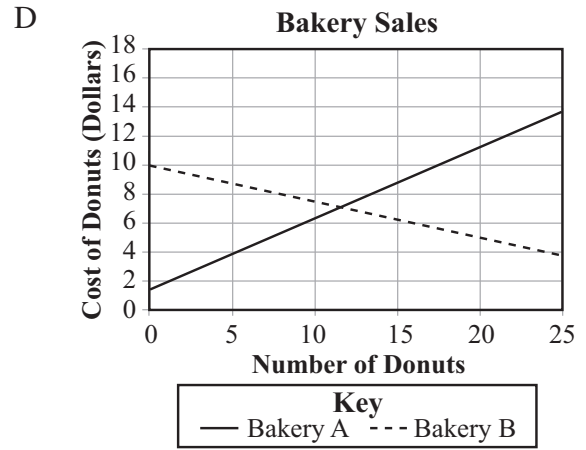
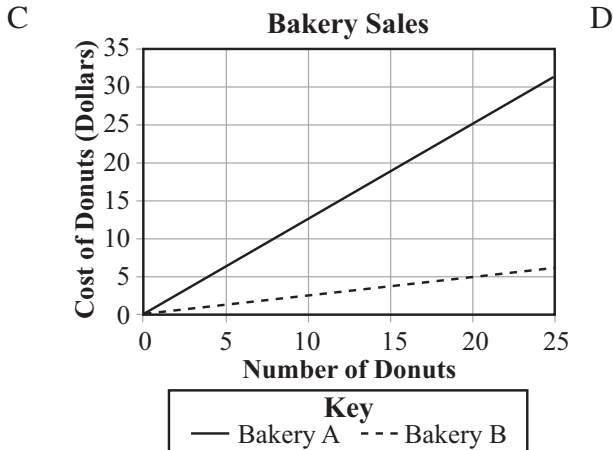
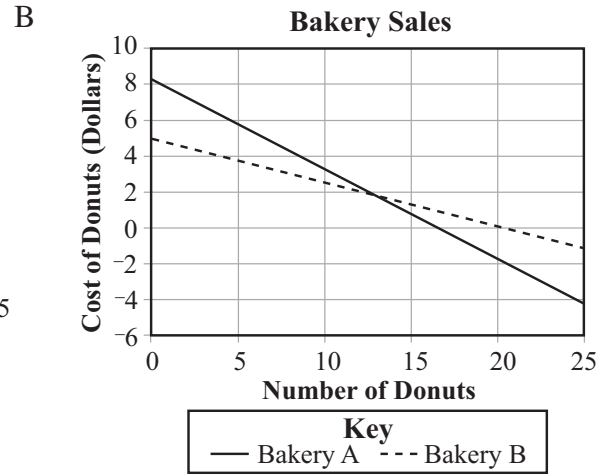
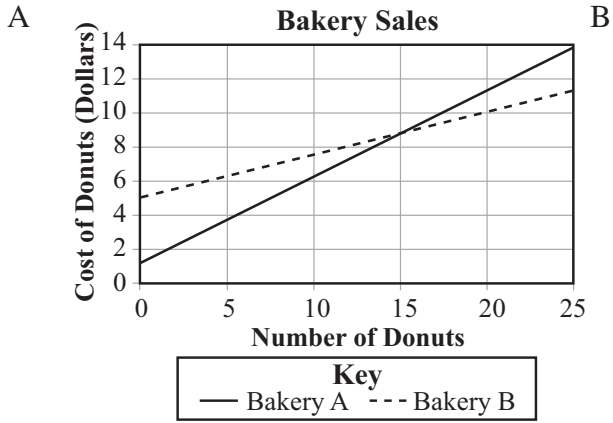
Fish	Servings
salmon	86
halibut	72
trout	42

Which statement is true?

- A Halibut was served the most on Sunday.
- B Salmon was ordered 40 more times than halibut.
- C More than half of the fish ordered was salmon and halibut.
- D About twice as much trout was ordered as compared with salmon.

# MATHEMATICS

40. Two local bakeries have membership programs for customers to buy donuts at special rates. Bakery A sells donuts for \$0.50 each and charges \$1.25 for its membership card. Bakery B sells donuts for \$0.25 each and charges \$5.00 for its membership card. Which graph **best** represents the relationship between total membership cost and the number of donuts sold?



## MATHEMATICS

41. Carl is driving a distance of 1,007 miles. His car travels 22 miles for every gallon of gas. He estimates that he will use 50 gallons of gas. Which statement about Carl's estimate is true?
- A His estimate is higher than the exact number by less than 10 gallons.
  - B His estimate is higher than the exact number by more than 10 gallons.
  - C His estimate is lower than the exact number by less than 10 gallons.
  - D His estimate is lower than the exact number by more than 10 gallons.
- 

42. When full, Jerry's backpack weighs 12 kilograms. What is the approximate weight, in pounds, of the full backpack?
- A 5.5
  - B 9.8
  - C 14.2
  - D 26.4

**Turn to page 26 in your answer booklet to complete question 43.**

## MATHEMATICS

44. A Siberian husky sled team has a minimum dog weight requirement of 60 pounds and a minimum dog height requirement of 21 inches. The table below lists potential dogs for the sled team.

**Siberian Huskies**

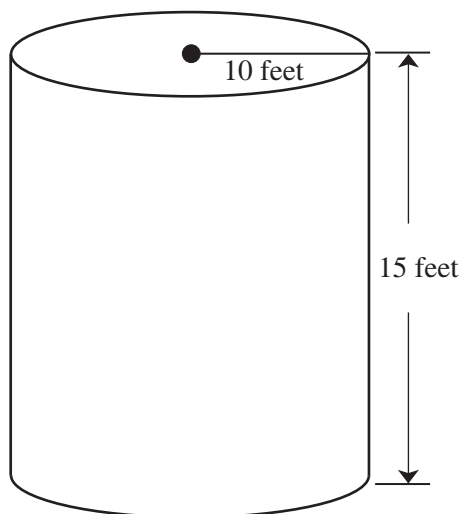
<b>Dog</b>	<b>Height of Dog (inches)</b>	<b>Weight of Dog (pounds)</b>
Finn	27	59
Maura	20	58
Nadia	22	61
Timber	20	63

Which dog meets the minimum requirements for the sled team?

- A Finn
- B Maura
- C Nadia
- D Timber

## MATHEMATICS

45. Winona has to paint the entire surface of the barrel shown below.



What is the surface area of the barrel including the top and bottom?

(Use 3.14 for  $\pi$ .)

- A 1,099 square feet
  - B 1,256 square feet
  - C 1,570 square feet
  - D 2,198 square feet
- 

46. A fish measures 22 inches in length. What is the length of the fish in centimeters?

- A 8.66
- B 24.54
- C 44.00
- D 55.88

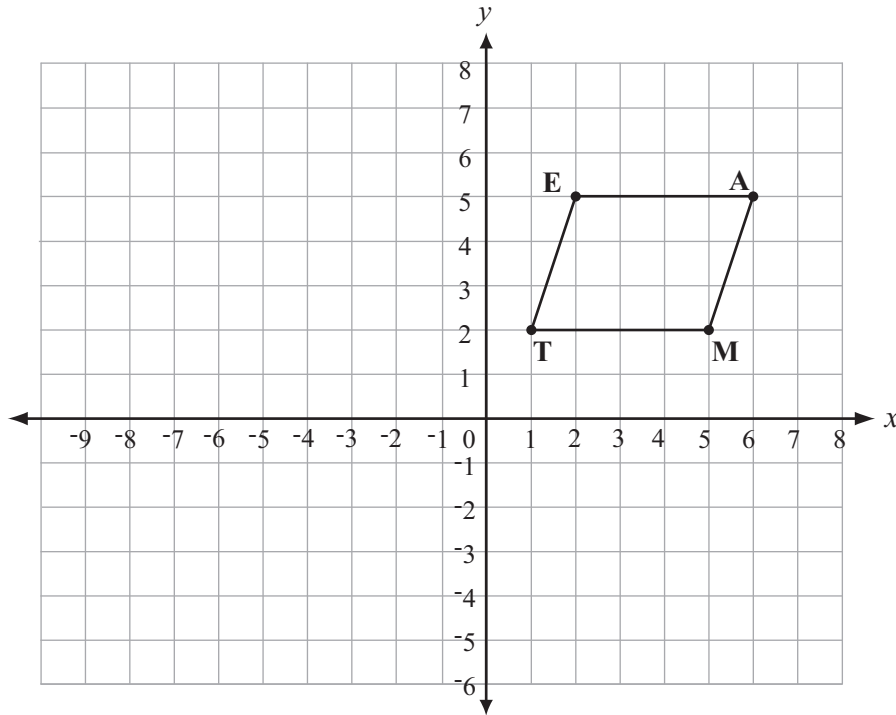


# MATHEMATICS

47. Which expression shows the result of doubling  $(\sqrt{3} + \sqrt{2})$ ?

- A  $\sqrt{10}$
- B  $2\sqrt{5}$
- C  $2\sqrt{3} + \sqrt{2}$
- D  $2\sqrt{3} + 2\sqrt{2}$

48. The graph below shows parallelogram  $TEAM$ .



A congruent parallelogram  $T'E'A'M'$  has coordinates  $E'(-7, 0)$ ,  $A'(-3, 0)$ , and  $M'(-4, -3)$ . What are the coordinates for point  $T'$ ?

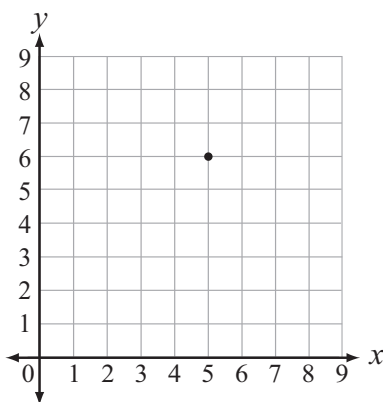
- A  $(-8, -3)$
- B  $(-7, -3)$
- C  $(-8, -2)$
- D  $(-7, -2)$

## MATHEMATICS

49. A dog weighs 36 pounds. Which expression represents the dog's weight in pounds?

- A  $3^1 + 6^2$
  - B  $3^{10} + 6^1$
  - C  $3^2 + 3^3$
  - D  $30^1 + 3^2$
- 

50. Henrietta is graphing a line. She graphed a point on the line, as shown below.



The slope of the line will be  $\frac{2}{3}$ . Which point will also lie on the line?

- A (7, 9)
- B (8, 8)
- C (7, 8)
- D (8, 9)

## MATHEMATICS

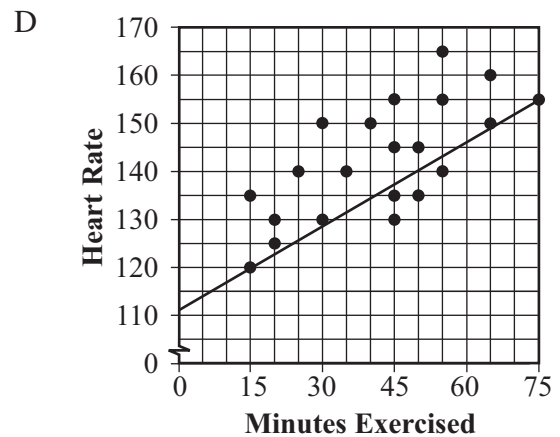
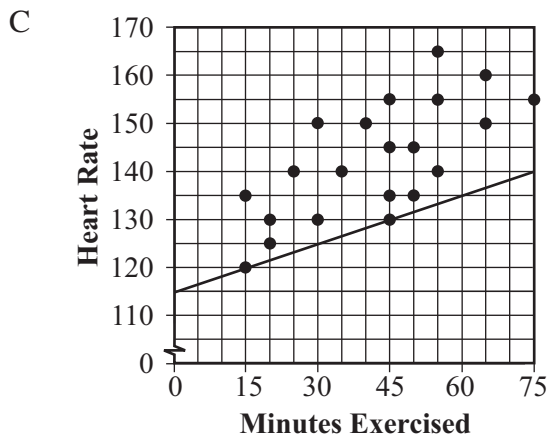
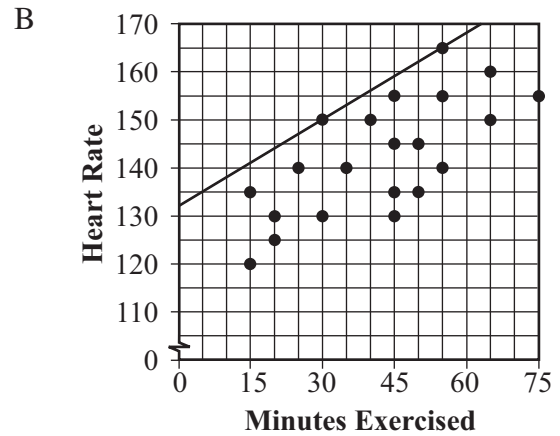
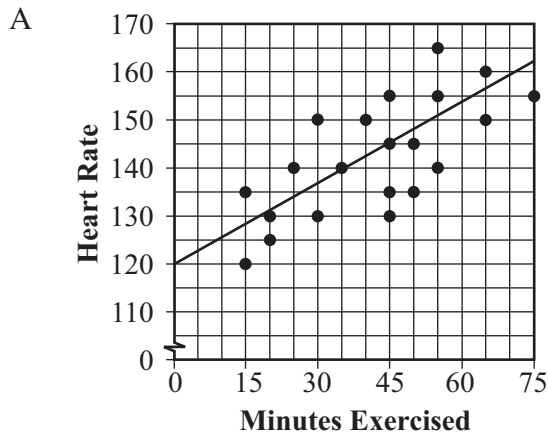
51. A machine has a tolerance of 0.00025 inch. What is the machine's tolerance, in inches, written in scientific notation?
- A  $0.125 \times 10^{-4}$
  - B  $0.25 \times 10^{-3}$
  - C  $2.5 \times 10^{-4}$
  - D  $2.5 \times 10^{-3}$
- 
52. Martha bought a bag of apples. She put 60% of the apples on the table. Her children ate 50% of the apples on the table. What percent of the bag of apples did the children eat?
- A less than 50%
  - B exactly 50%
  - C between 50% and 60%
  - D more than 60%
- 
53. A parking lot is shaped like a square. The length of each side is 50 feet. What is the length of the diagonal of the parking lot?
- A  $\sqrt{100}$  feet
  - B  $\sqrt{200}$  feet
  - C  $\sqrt{5,000}$  feet
  - D  $\sqrt{10,000}$  feet

# MATHEMATICS

54. Ben types at a rate of 50 words per minute. He typed 4 pages with 250 words on each page without stopping. How many minutes did it take Ben to type the pages?

- A 5
- B 20
- C 200
- D 1,000

55. Cody graphed the results of the minutes she exercised versus her heart rate. Which scatter plot shows the line of best fit?



## MATHEMATICS

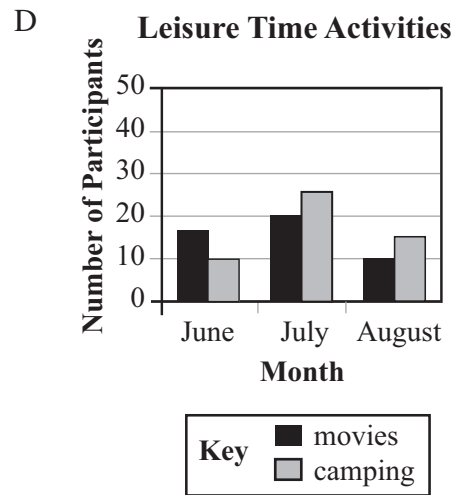
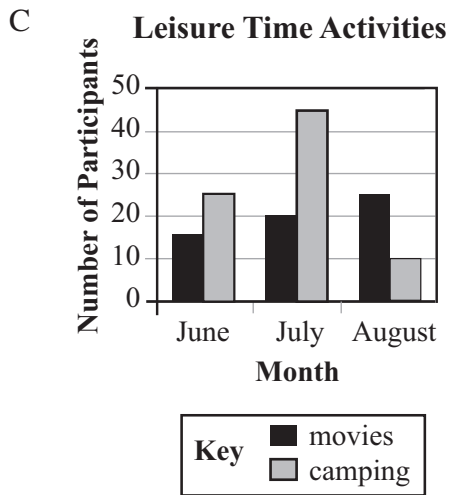
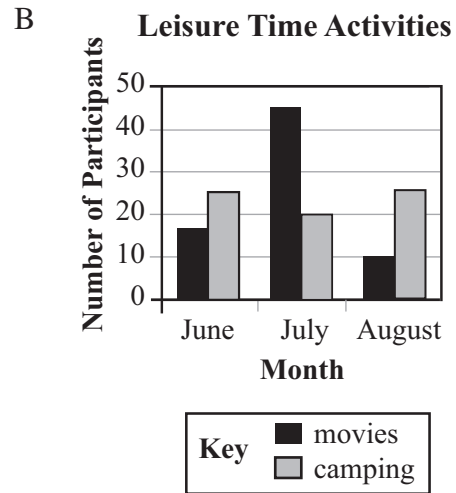
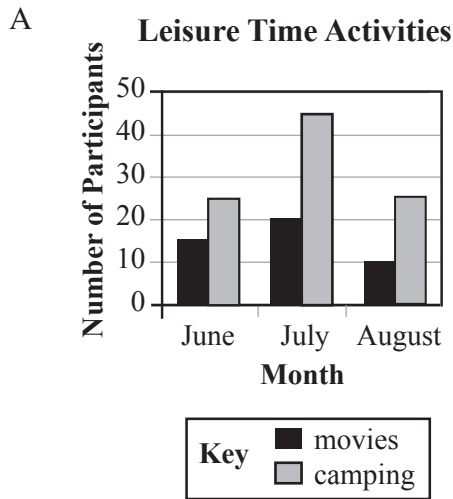
56. A cone-shaped paper cup is 8 centimeters high and has a diameter of 6 centimeters. How many cubic centimeters of water will it hold when full?
- A  $8\pi$
  - B  $24\pi$
  - C  $72\pi$
  - D  $96\pi$

# MATHEMATICS

57. Tia recorded the number of her friends who watched a movie or went camping each month during the summer. The table she made is shown below.

Leisure Time Activities			
	June	July	August
movies	15	20	10
camping	25	45	25

What graph shows the data Tia recorded?



## MATHEMATICS

58. Greg is traveling from Anchorage to Eagle River, a distance of 10 miles. About how many kilometers does Greg have to travel?
- A 6.2
  - B 9.4
  - C 10.6
  - D 16.1

Turn to page 28 in your answer booklet to complete question 59.

**END SESSION**

