

Montana

Comprehensive Assessment

System *(MontCAS, Phase 2 CRT)*

Student Name:

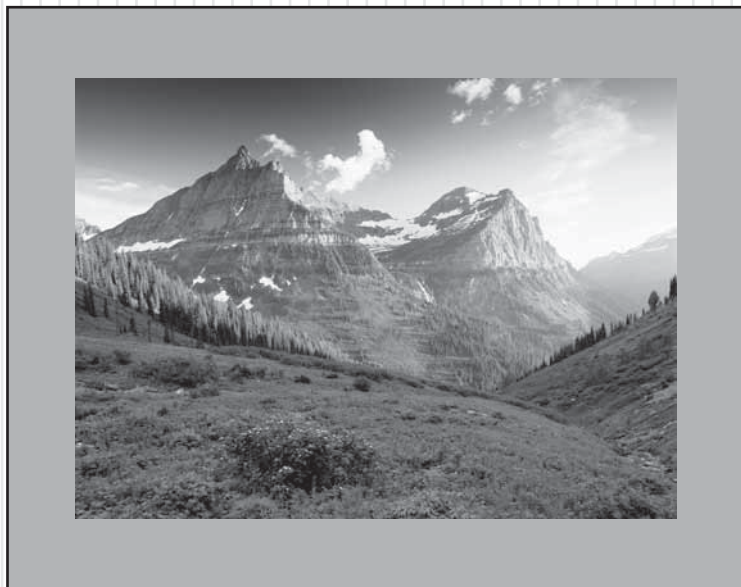
School Name:

Teacher/Class:

GRADE 8

FORM 1

SPRING 2006



OPI

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Mathematics

Session 1 (Calculator)

This test session includes multiple-choice questions and a question for which you must show your work or write out your answer. You may use a calculator during this session.

Mark your answers to questions 1 through 24 in the section marked "Mathematics—Session 1 (Calculator)" in your Student Response Booklet.

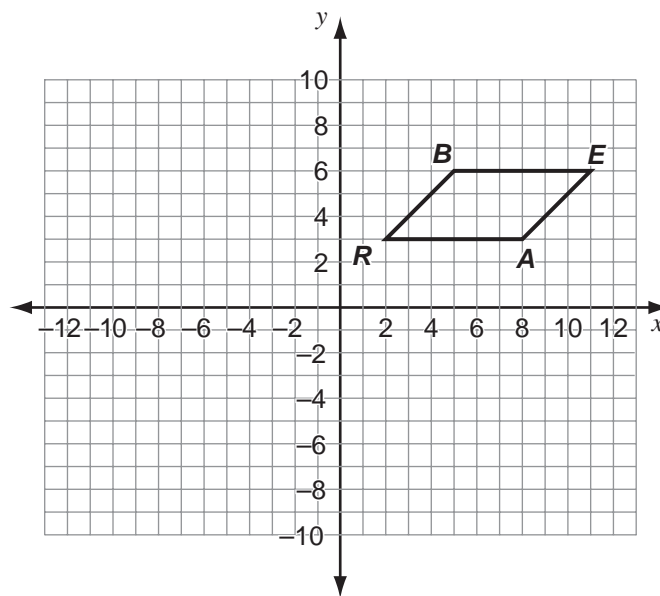
1. Brian is comparing prices of dress shirts in 5 stores. The prices are shown below.

\$13.99 \$17.49 \$14.69 \$18.29 \$14.29

What is the mean price of a shirt?

- A. \$13.99
 - B. \$14.69
 - C. \$15.75
 - D. \$16.14
2. Which word can be used to describe **all** equilateral triangles?
- A. scalene
 - B. right
 - C. obtuse
 - D. acute

Use the graph below to answer question 3.



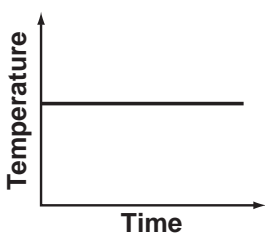
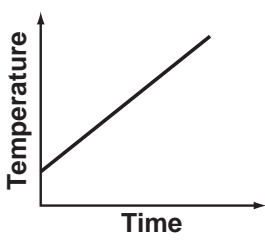
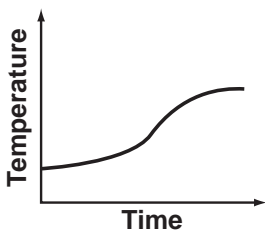
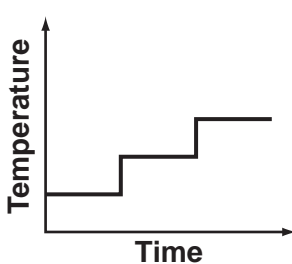
3. Parallelogram *BEAR* is reflected across the y-axis. What are the coordinates of the image of vertex *E*?
- A. (−11, 6)
 - B. (11, −6)
 - C. (−6, −11)
 - D. (−11, −6)



4. Sandy took the temperature of the water in a pond during the day. The chart below shows the temperature of the water every two hours.

Time	Temperature (°F)
8 A.M.	50
10 A.M.	55
12	65
2 P.M.	80
4 P.M.	85

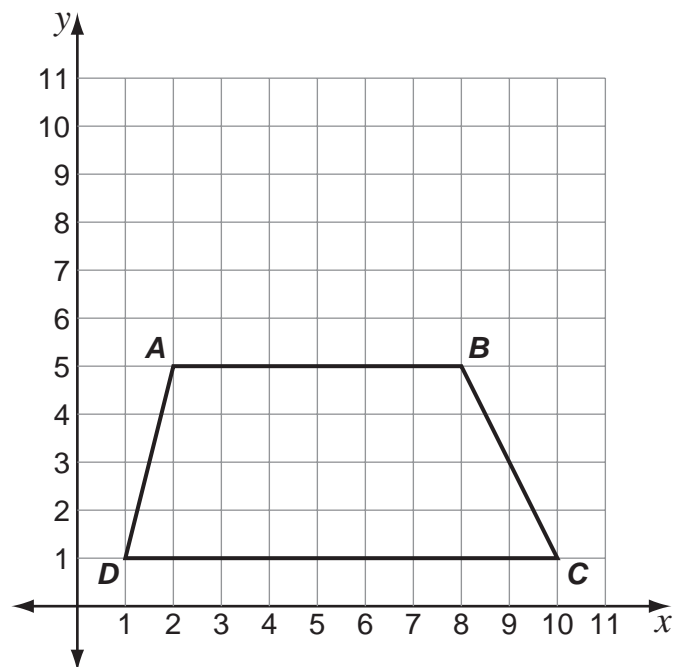
Which graph best represents the temperature of the water during that day?

- A. 
- B. 
- C. 
- D. 

5. One evening, the temperature in Montreal was 5° Celsius. Which of the following is the **best** estimate of this temperature in degrees Fahrenheit?

- A. 20° Fahrenheit
 B. 40° Fahrenheit
 C. 60° Fahrenheit
 D. 80° Fahrenheit

Use the graph below to answer question 6.



6. What is the length of side \overline{BC} , to the nearest hundredth?
- A. 2.45 units
 B. 3.46 units
 C. 4.12 units
 D. 4.47 units



7. A diagonal of a square divides the square into two triangles. Which two words describe these triangles?

A. right, isosceles
 B. right, equilateral
 C. acute, isosceles
 D. acute, equilateral

8. A cookie recipe uses 3 cups of flour to make 4 dozen cookies. Colin wants to make 7 dozen cookies. What proportion could he solve to determine how much flour he needs?

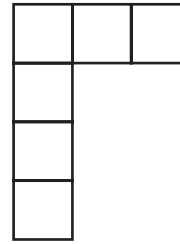
A. $\frac{3}{4} = \frac{7}{?}$
 B. $\frac{3}{7} = \frac{4}{?}$
 C. $\frac{3}{4} = \frac{?}{7}$
 D. $\frac{4}{3} = \frac{?}{7}$

9. Loretta has a bag containing 11 marbles. Of these marbles, 2 are white, 3 are red, and 6 are blue. If she picks a marble out of the bag at random, what is the probability that the marble is **not** red?

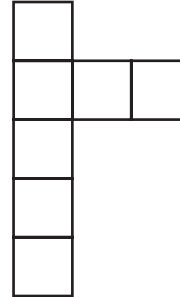
A. $\frac{3}{11}$
 B. $\frac{8}{11}$
 C. $\frac{8}{22}$
 D. $\frac{3}{22}$

10. Which net could be folded into a cube?

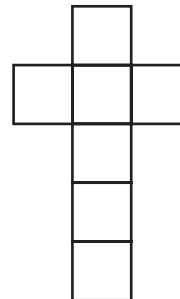
A.



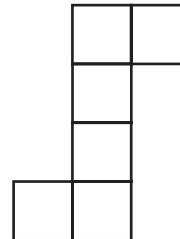
B.



C.



D.



11. The table below shows a pattern.

n	k
1	1
2	4
3	7
4	10

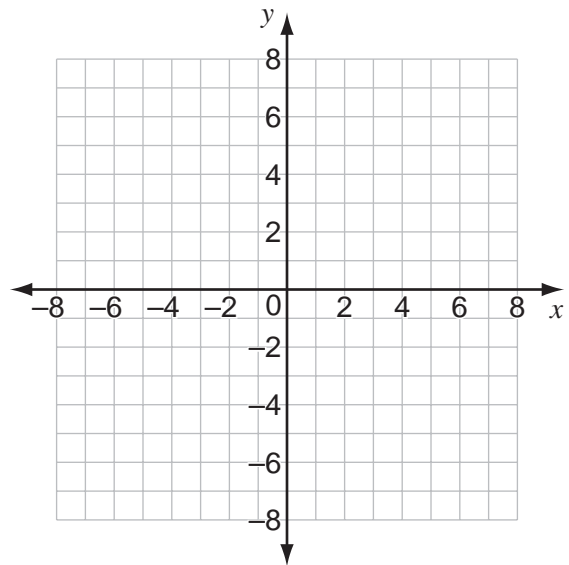
If this pattern continues, what is the value of k when $n = 10$?

- A. 28
- B. 29
- C. 30
- D. 31

12. Kylee tested 12 batteries and found that 2 were defective. What percent of the batteries were defective?

- A. 2%
- B. $16\frac{2}{3}\%$
- C. 20%
- D. $33\frac{1}{3}\%$

You may use the grid below to answer question 13.



13. Triangle ELM was transformed into triangle $E'L'M'$. The coordinates of the vertices of the triangles are shown below.

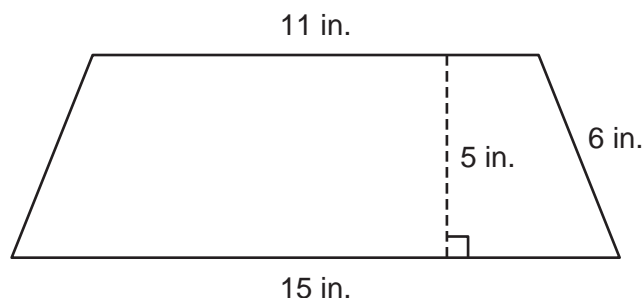
$E (2, 4)$	$E' (4, -1)$
$L (4, 5)$	$L' (6, 0)$
$M (6, 3)$	$M' (8, -2)$

Which translation describes the relationship between the two triangles?

- A. right 5, down 2
- B. left 5, up 2
- C. right 2, down 5
- D. left 2, up 5



14. The lunch trays at a school cafeteria are shaped like trapezoids as shown below.



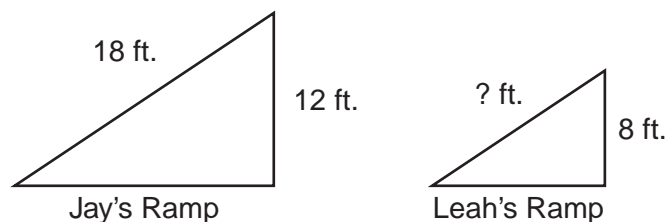
What is the area of the lunch tray?

- A. 65 square inches
 - B. 75 square inches
 - C. 78 square inches
 - D. 90 square inches
15. A restaurant owner wants to estimate the number of customers who will choose each type of side order. She took a survey of 50 customers. The results are shown in the table below.

Type of Side Order	Number of Customers
French fries	32
Baked potato	11
Coleslaw	7

Based on the results in the table, about how many of the next 300 customers will choose French fries as a side order?

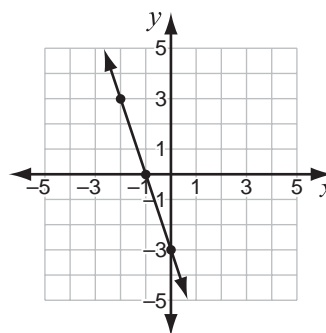
16. Leah is building a skateboard ramp that is similar to Jay's skateboard ramp, as shown below. Jay's ramp has the following dimensions: length = 18 feet and height = 12 feet.



Leah wants the height of her ramp to be 8 feet. What should the length of Leah's ramp be if it is **similar** to Jay's ramp?

- A. 16
- B. 14
- C. 12
- D. 9

Use the graph below to answer question 17.

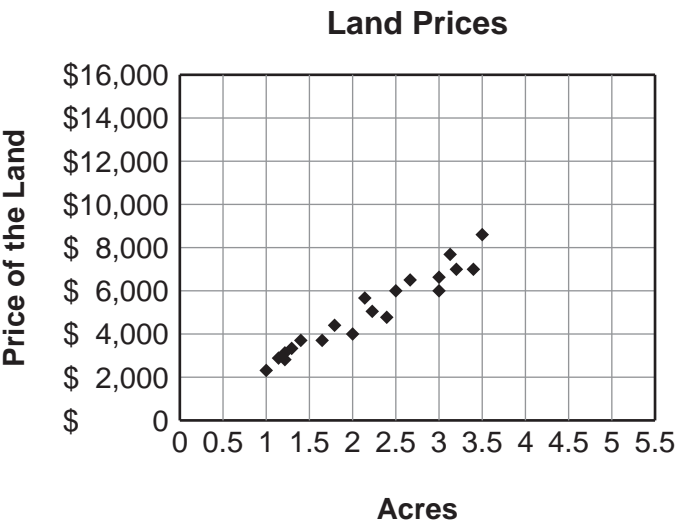


17. What is the equation of this line?

- A. $y = -3x - 3$
- B. $y = -3x + 3$
- C. $y = 3x + 3$
- D. $y = 3x - 3$



18. Mrs. Lee researched the prices of land for sale in her area. She found the graph shown below.



Mrs. Lee wants to sell 5.2 acres of land. Based on the information in the graph, at about what price should she sell her land?

- A. \$ 8,000
- B. \$11,000
- C. \$15,000
- D. \$16,000

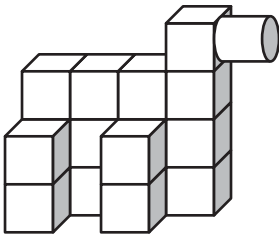
19. For a science experiment, Nori drops a ball and then records the height of each of its first four bounces. Her data are shown below.

	1st bounce	2nd bounce	3rd bounce	4th bounce
Height in cm	81	27	9	3

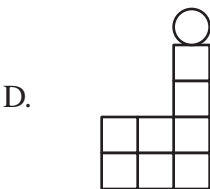
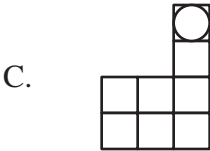
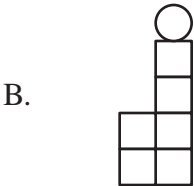
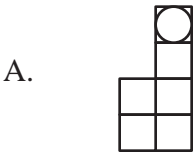
What rule describes the change in height from one bounce to the next?

- A. subtract 54
- B. subtract 6
- C. divide by 9
- D. divide by 3

Use the figure shown below to answer question 20.



20. Which diagram shows this figure viewed from the right?



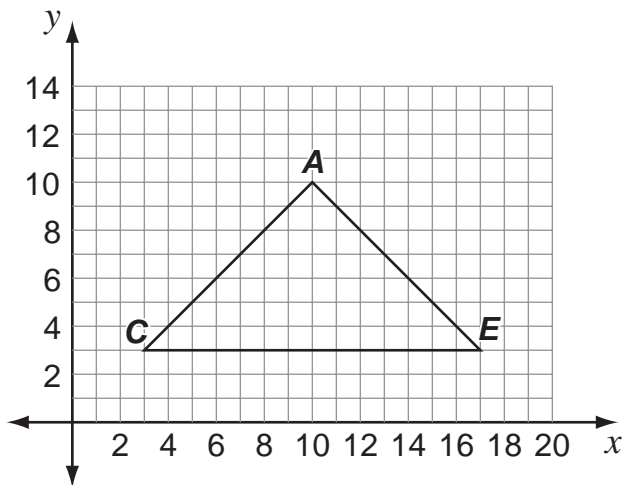
21. Look at the expression below.

$$3(2c + 5)$$

Which expression is equivalent?

- A. $5c + 8$
- B. $5c + 15$
- C. $6c + 5$
- D. $6c + 15$

22. Look at the triangle below.



What is the area of triangle ACE ?

- A. 30 square units
- B. 49 square units
- C. 70 square units
- D. 98 square units

23. A city tennis court can be rented for a \$5 fee plus \$2 per hour of use. Which expression can be used to find the cost of renting the tennis court for x hours?

- A. $5 + 2x$
- B. $5x + 2$
- C. $5 + \frac{x}{2}$
- D. $5 + \frac{2}{x}$

24. Dena made the graph below to show the price she charges for preparing food for a banquet.



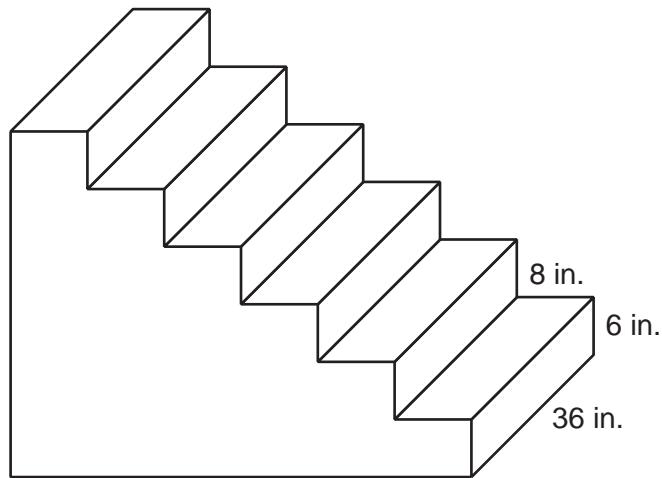
How does Dena compute the price she charges for a banquet?

- A. She charges \$7.50 per person.
- B. She charges \$8.00 per person.
- C. She charges \$100 for the first 20 people and \$1 for each additional person.
- D. She charges \$100 for the first 20 people and \$10 for each additional person.



Write your answer to question 25 in the space provided for it in your Student Response Booklet. Show all of your work.

25. The staircase shown below is made entirely out of concrete.



There are 6 steps. Each step has the same dimensions.

- What is the height, in feet, of the entire staircase?
- What is the volume of the bottom step in cubic feet? Show or explain how you found your answer.
- What is the volume of the entire staircase in cubic feet? Show or explain how you found your answer.

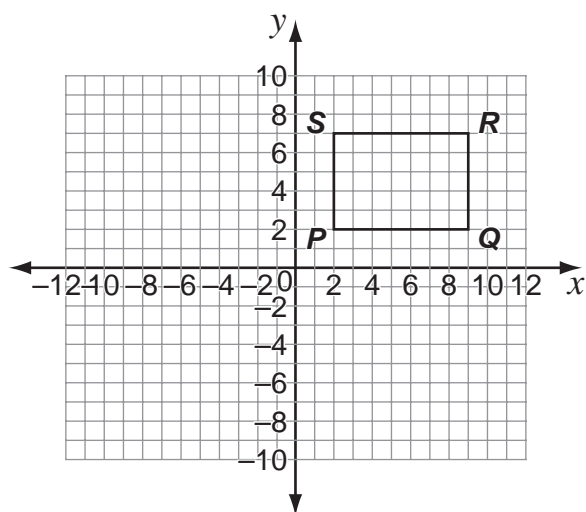
Mathematics

Session 2A (Calculator)

This test session includes multiple-choice questions and a question for which you must show your work or write out your answer. You may use a calculator during this session.

Mark your answers to questions 26 through 33 in the section marked “Mathematics—Session 2A (Calculator)” in your Student Response Booklet.

Use the graph below to answer question 26.



26. What are the coordinates of the image of vertex R when rectangle $PQRS$ is rotated 90° clockwise about vertex P ?

- A. $(9, -7)$
- B. $(-5, -3)$
- C. $(2, -5)$
- D. $(7, -5)$

27. The student council president wants to ask a group of students to take a survey about school social events. Which method would give results that **best** represent the student body?

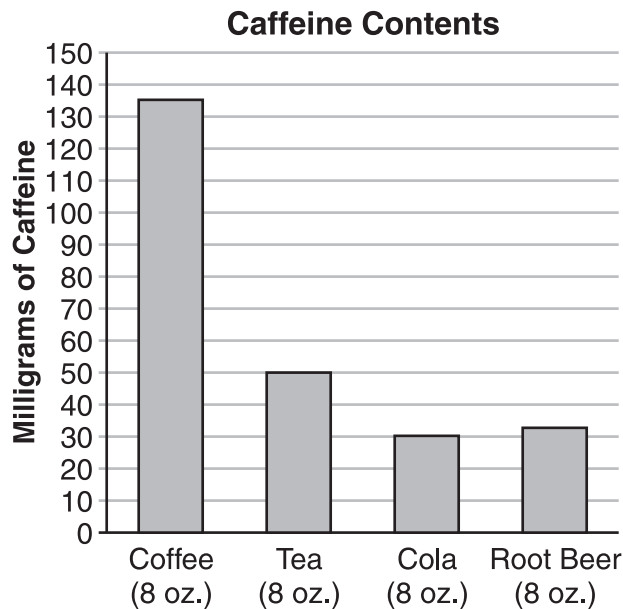
- A. Ask for 20 volunteers to take the survey.
- B. Pick 20 honor roll students to take the survey.
- C. Mix all students' names in a hat and pick 20 to take the survey.
- D. Ask 20 students who live near the president to take the survey.

28. Which container of juice has the lowest cost per unit?

- A. one gallon for \$3.99
- B. one half-gallon for \$1.99
- C. one quart for \$1.09
- D. one pint for \$0.59



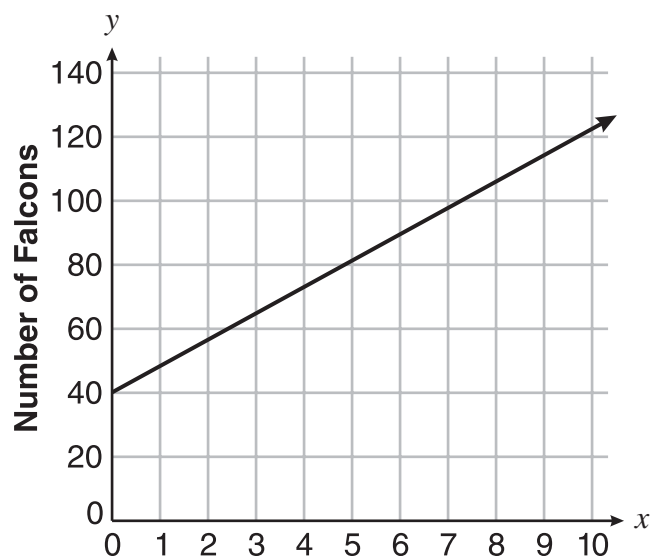
29. Rafe graphed the amount of caffeine in 8 ounces of some beverages.



Which statement is correct, according to the data in the graph?

- A. Coffee has more than five times as many milligrams of caffeine per ounce as root beer.
- B. Coffee has more than three times as many milligrams of caffeine per ounce as tea.
- C. Tea has less than one-fourth as many milligrams of caffeine per ounce as coffee.
- D. Tea has less than twice as many milligrams of caffeine per ounce as root beer.

30. A scientist studying the population of a species of falcon in a national park made the graph below.



What information does the y-intercept of the graph provide about the falcon population?

- A. There were about 40 falcons when the study began.
- B. The study lasted 10 years.
- C. The population is growing by approximately 8 falcons a year.
- D. There are currently about 125 falcons.



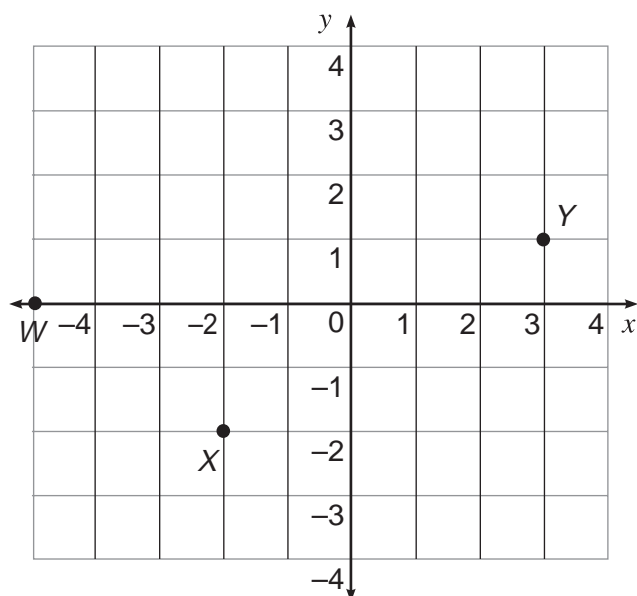
Mathematics

Session 2B (No Calculator)

This test session includes multiple-choice questions and questions for which you must show your work or write out your answer. You may NOT use a calculator during this session.

Mark your answers to questions 35 through 41 in the section marked “Mathematics—Session 2B (No Calculator)” in your Student Response Booklet.

Use the coordinate grid below to answer question 35.



35. Which pair of coordinates should be assigned to a point Z so that WXYZ is a parallelogram?

- A. $(-2, 2)$
- B. $(-2, 3)$
- C. $(0, 2)$
- D. $(0, 3)$

36. Which equation is equivalent to $a + b = c$?

- A. $c - b = a$
- B. $b = a + c$
- C. $a - c = b$
- D. $a = c + b$

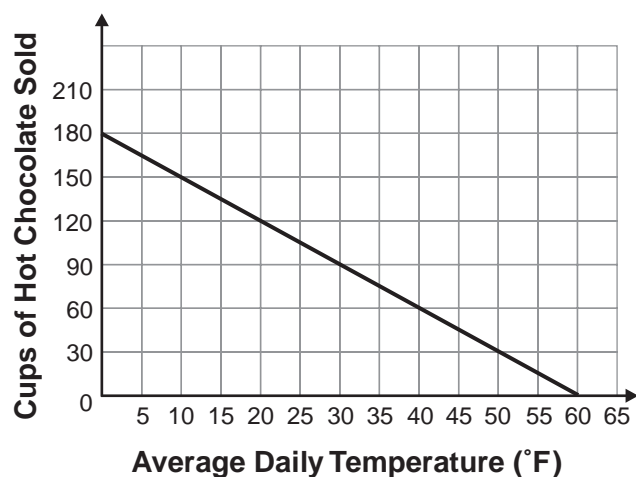
37. A unit of measure called the grain is used to measure the weight of very small items. One grain is 0.002285 ounce. Which expression shows the number of ounces in a grain in scientific notation?

- A. 2.285×10^2
- B. 2.285×10^{-2}
- C. 2.285×10^3
- D. 2.285×10^{-3}



38. A commercial for Rola Cola states that 2 out of 3 people prefer Rola Cola to Sunshine Cola. Approximately what percent of people prefer Rola Cola?
- A. 23%
 - B. 33%
 - C. 67%
 - D. 75%

39. The graph below shows the average number of cups of hot chocolate sold each day at a snack bar compared to the average daily temperature in degrees Fahrenheit.



What does the slope of the graph mean in this situation?

- A. For every 1-degree increase in temperature, 3 fewer cups are sold.
- B. For every 1-degree increase in temperature, 3 more cups are sold.
- C. For every 1-degree increase in temperature, 10 fewer cups are sold.
- D. For every 1-degree increase in temperature, 10 more cups are sold.



Mathematics

Session 3 (No Calculator)

This test session includes multiple-choice questions and questions for which you must show your work or write out your answer. You may NOT use a calculator during this session.

Mark your answers to questions 44 through 64 in the section marked “Mathematics—Session 3 (No Calculator)” in your Student Response Booklet.

44. Michelle has a summer job. She earns \$6.75 per hour plus a \$100 bonus if she stays the entire summer season. Which expression can be used to find how much money Michelle will earn if she works h hours and stays the entire summer season?

A. $106.75 + h$
B. $106.75h$
C. $6.75h + 100$
D. $6.75 + 100h$

45. What is the rule for the pattern shown in the table below?

x	y
1	2
2	5
3	10
4	17

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

46. A fruit punch recipe that serves 8 people calls for $2\frac{1}{2}$ cups of pineapple juice. How many cups of pineapple juice are needed to make enough fruit punch to serve 20 people?

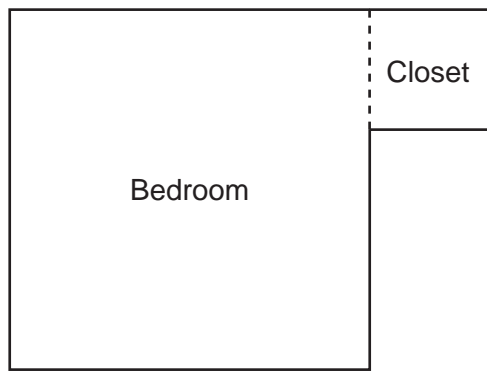
A. 8
B. $7\frac{1}{2}$
C. $6\frac{1}{4}$
D. 6

47. The approximate distance between the Sun and the planet Jupiter is 778 million kilometers. What is this distance expressed in scientific notation?

A. 778×10^6 km
B. 77.8×10^7 km
C. 7.78×10^8 km
D. 7.78×10^6 km



48. A closet and a bedroom are each in the shape of a square, as shown below.



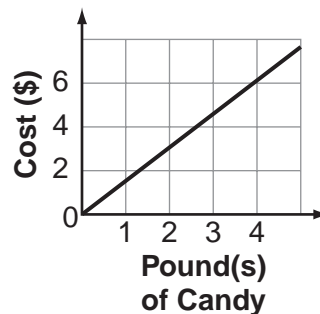
Not to scale

The length of one side of the closet is $\frac{1}{3}$ the length of one side of the bedroom. Carpet is sold by the square foot. How does the amount of carpet needed for the closet compare to the amount needed for the bedroom?

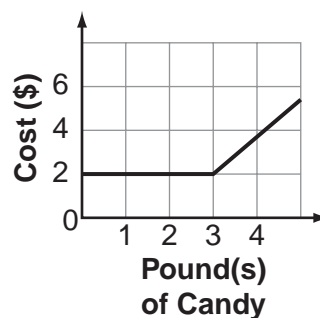
- A. $\frac{1}{9}$ as much is needed
- B. $\frac{1}{6}$ as much is needed
- C. $\frac{1}{3}$ as much is needed
- D. $\frac{1}{2}$ as much is needed

49. Nick's Shop sells candy with a gift basket. The gift basket costs \$2 and the candy costs \$1.50 per pound. Which graph **best** represents the cost of buying candy with a gift basket?

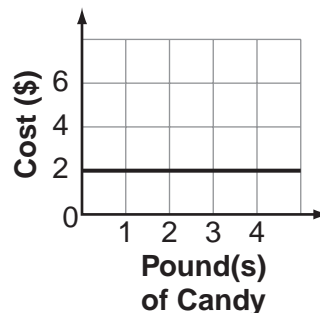
A.



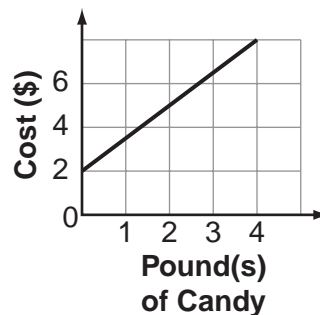
B.



C.



D.



50. Greenland is a large island northeast of Canada. Approximately 81% of Greenland is covered with ice year-round. Which fraction is closest to 81%?

A. $\frac{3}{4}$
 B. $\frac{4}{5}$
 C. $\frac{17}{20}$
 D. $\frac{21}{25}$

51. What is the value of this expression?

$$20 - (5 - 2)^2 \cdot 2$$

A. 2
 B. 8
 C. 22
 D. 28

Use the following expression to answer question 52.

$$(24 \times 5) + (24 \times 15)$$

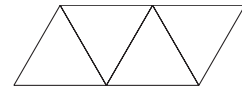
52. Which expression is equivalent?

A. $24(5 + 15)$
 B. $5(24 + 10)$
 C. $24(5 \times 15)$
 D. $5(24 + 3)$

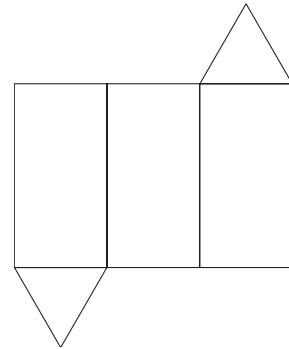
53. Which net can be used to form a triangular prism?



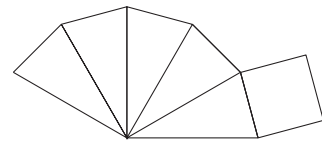
B.



C.



D.

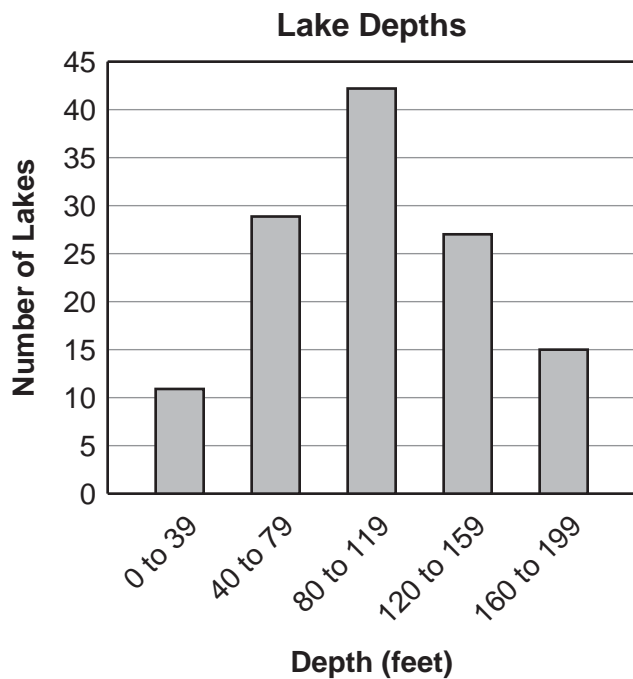


54. Kira's car holds 12 gallons of gas when full. On average, the car gets 30 miles per each gallon of gas. About how many miles will Kira be able to travel on a **quarter** of a tank of gas?

A. 30 miles
 B. 90 miles
 C. 180 miles
 D. 360 miles



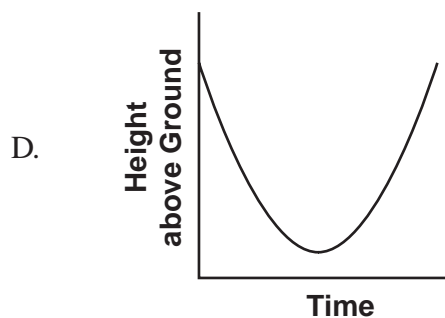
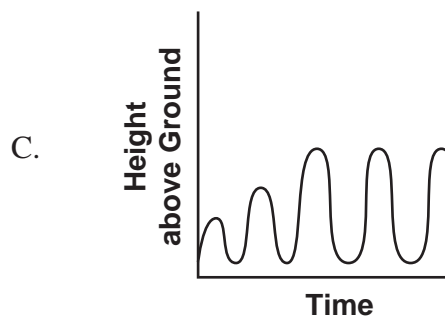
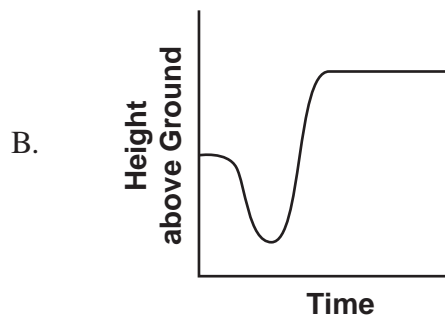
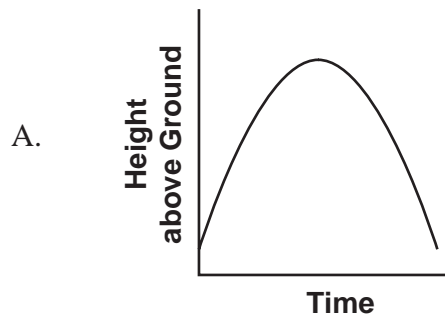
55. *Lakes Living* magazine included this graph in an article about the depths of 124 different lakes.



About what percent of the lakes are less than 80 feet deep?

- A. 30%
- B. 40%
- C. 50%
- D. 60%
56. Which expression has the least value?
- A. $12 + \sqrt{4}$
- B. $12 - \sqrt{4}$
- C. $12 \times \sqrt{4}$
- D. $12 \div \sqrt{4}$

57. Kyle is swinging on a playground swing. Which graph below could show Kyle's height above ground during the first minute after he starts swinging?



58. What is the prime factorization of 36?

- A. $2^3 \times 3^2$
- B. 4×3^2
- C. $2^2 \times 9$
- D. $2^2 \times 3^2$

59. The equation below relates the length in inches, y , of a candle to the number of minutes, x , that the candle has been burning.

$$y = -0.1x + 9$$

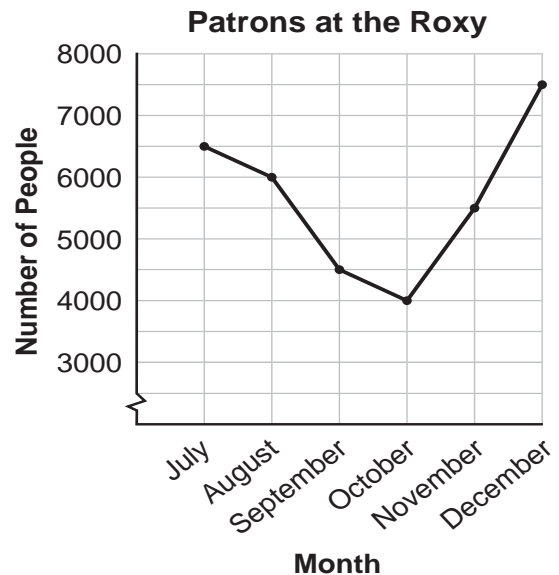
According to the equation, which of the following is true about the candle?

- A. It shrinks 0.1 inch in 1 minute.
- B. It shrinks 1 inch in 0.1 minute.
- C. It shrinks 0.1 inch in 9 minutes.
- D. It shrinks 9 inches in 0.1 minute.

60. Leta has a babysitting job. Her rates are \$5 per hour before midnight and \$6 per hour after midnight. Which expression represents her earnings if she works b hours before midnight and a hours after midnight?

- A. $(5 + b) + (6 + a)$
- B. $(5 + a) + (6 + b)$
- C. $5a + 6b$
- D. $5b + 6a$

61. The graph below shows the number of people who went to The Roxy Theater to see a movie each month for six months.

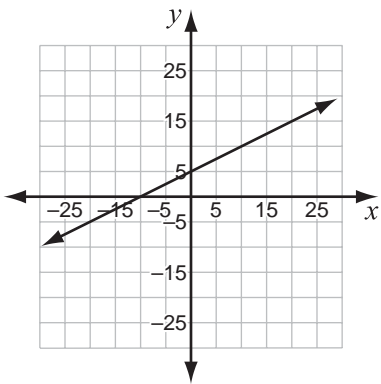


In which month was there the greatest decrease in the number of moviegoers from the previous month?

- A. August
- B. September
- C. October
- D. December



Use the graph below to answer question 62.

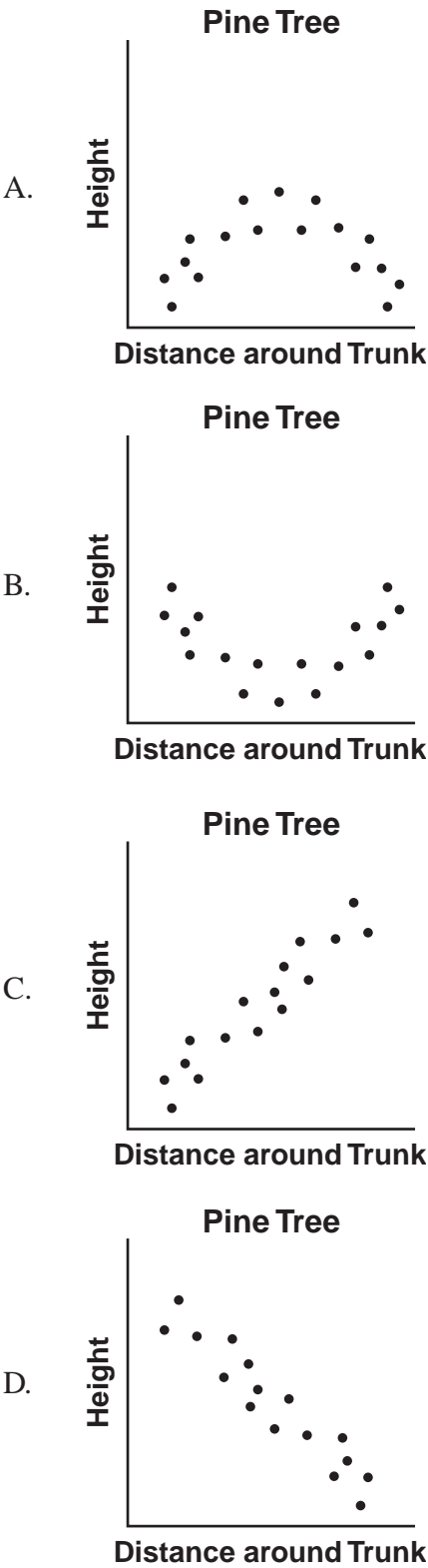


62. What is the y-intercept of this line?
- A. -10
B. -5
C. 5
D. 10
63. Mr. Garcia celebrated his 40th birthday by taking his 8-year-old son and 6-year-old daughter to the movies. The chart below shows the ticket prices.

Adult	\$8.75
Child (12 and under)	\$5.50
Senior (55 and over)	\$5.00

- What was the total cost of the tickets for Mr. Garcia and his two children?
- A. \$23.00
B. \$19.75
C. \$19.25
D. \$18.75

64. Which scatter plot shows the **most** likely relationship between the height of a pine tree and the distance around the pine tree's trunk?



Write your answers to questions 65 through 67 in the spaces provided in your Student Response Booklet. Show all of your work.

65. What is the value of the expression below if $a = -2$ and $b = 5$?

$$ab + a^2$$

67. Solve for x .

$$3x + 3 = -9$$

66. What is 140% of 20?



Write your answer to question 68 in the space provided for it in your Student Response Booklet. Show all of your work.

68. The following sandwich choices are offered at Victor's Sandwich Bar.

Victor's Sandwich Choices

Bread	Meat	Cheese
Wheat	Turkey	American
Rye	Chicken	Swiss
	Beef	

- How many different sandwich choices are possible if every choice consists of one type of bread, one meat, and one cheese? Show your work or explain how you found your answer.
- A Deluxe Sandwich consists of one type of bread, **two** meats, and one cheese. How many different Deluxe Sandwich choices are possible? Show your work or explain how you found your answer.