

Student Name:

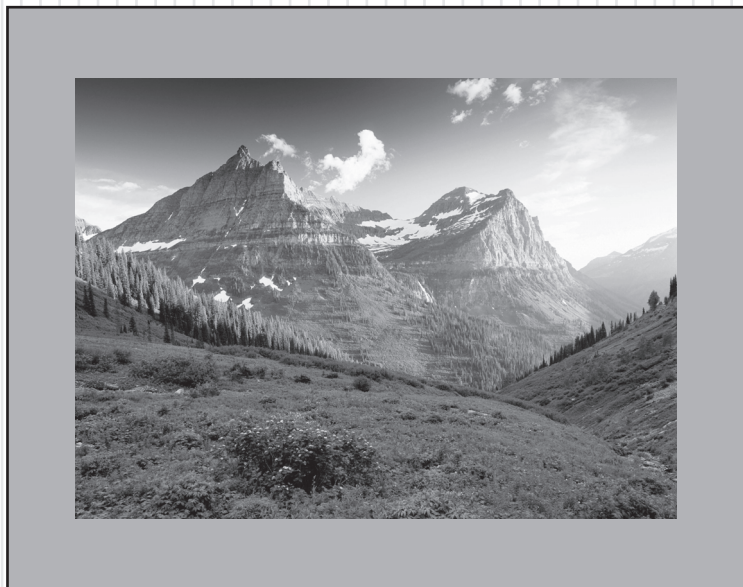
School Name:

Teacher/Class:

Montana

*Comprehensive Assessment
System (MontCAS, Phase 2 CRT)*

GRADE 7
COMMON RELEASED ITEMS
SPRING 2007



OPI

OFFICE OF PUBLIC INSTRUCTION



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.

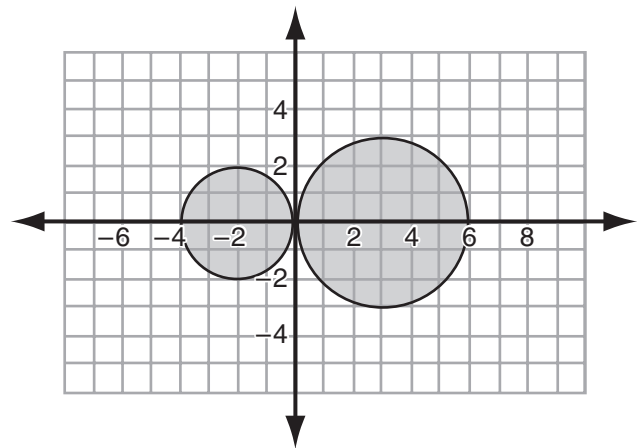
Mark your answers to questions 1 through 24 in the section marked "Mathematics—Session 1 (Calculator)" in your Student Response Booklet.

Use the table below to answer question 1.

A	B
2	8
4	14
6	20
8	26

1. What is the rule for changing the numbers in column **A** to the numbers in column **B**?
- A. Add 6.
 - B. Multiply by 4.
 - C. Multiply by 3 and then add 2.
 - D. Multiply by 4 and then subtract 2.

2. The shaded region on the grid below shows the area that underwater explorers have explored while looking for sunken treasure.



Which point on the grid have they **not** explored?

- A. $(1, -2)$
- B. $(-1, 2)$
- C. $(2, -1)$
- D. $(-2, 1)$



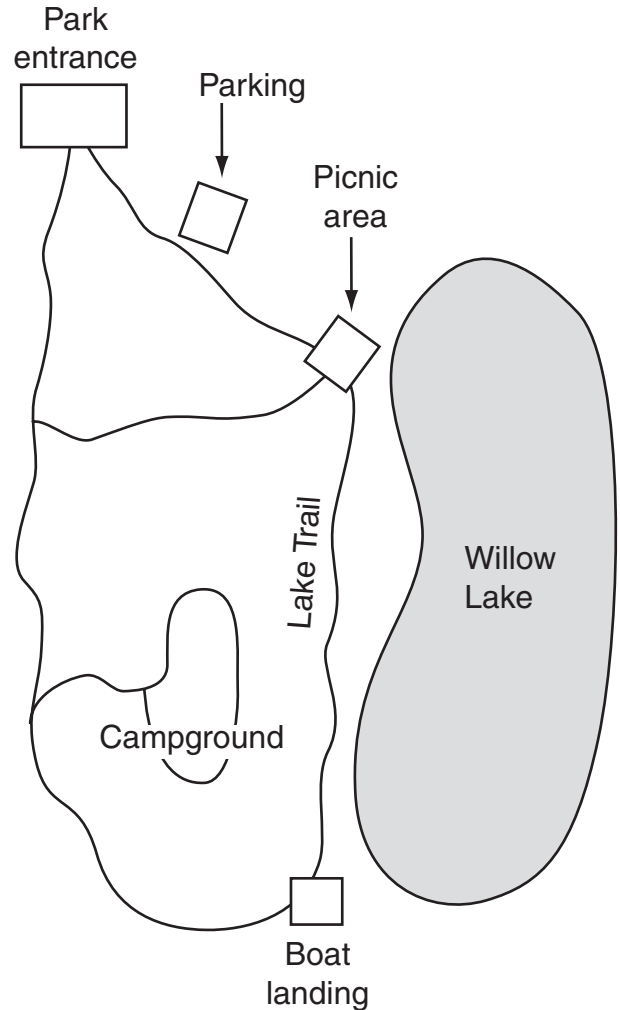
3. State police use this equation to calculate the stopping distance in feet, d , of a car traveling s miles per hour.

$$d = (s + s^2) \div 20$$

A man in an accident claims that he had been traveling 30 miles per hour just before the accident occurred. If he is correct, what would have been his stopping distance?

- A. 31.5 feet
 B. 46.5 feet
 C. 60 feet
 D. 135 feet
4. The school board is surveying teachers about their use of computers in the classroom. Which question would be the **least** helpful for the school board to ask when deciding whether to approve the purchase of new computers?
- A. Which software program did the students like the most?
 B. Is the computer a valuable tool in student learning?
 C. About how many hours per week were computers used in the classroom?
 D. What are the disadvantages of using computers in the classroom?

Use your ruler and the map below to answer question 5.



5. On this map, $\frac{1}{2}$ inch represents one-fourth of a mile. Which is the **best** estimate of the distance from the picnic area to the boat landing along Lake Trail?
- A. 0.625 mile
 B. 1.25 miles
 C. 1.875 miles
 D. 2.5 miles



6. What is the value of this expression?

$$3 \times 6 - 4 + 8 \div 2$$

- A. 7
- B. 10
- C. 11
- D. 18

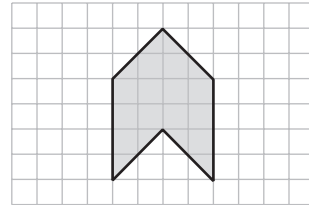
7. Denise finished four crossword puzzles. She finished her first puzzle in 21 minutes, her second in 25 minutes, her third in 17 minutes, and her fourth in 25 minutes. What was Denise's average (mean) time to complete a crossword puzzle?

- A. 18 minutes
- B. 22 minutes
- C. 23 minutes
- D. 25 minutes

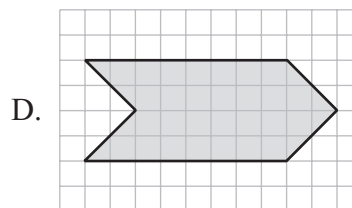
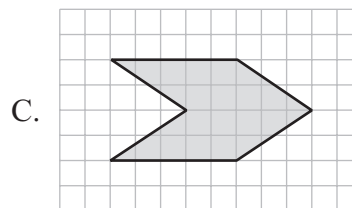
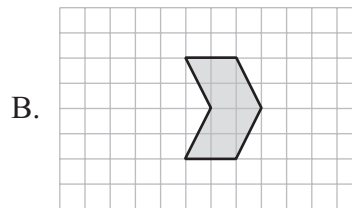
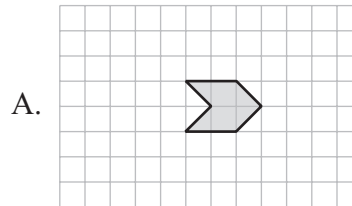
8. A horse show travels across the country. In each city, 25 free horse show tickets are donated to a local charity. All other tickets are sold for \$10 each. What expression represents the amount of money, m , that is collected when t tickets are available for the show?

- A. $m = t - 25$
- B. $m = 15t$
- C. $m = 10t - 25$
- D. $m = 10(t - 25)$

9. Adam drew the shape below.



Which shape is similar to the one that Adam drew?



10. Alexis and Gordon each completed a 20-mile bike race. Alexis averaged 8 miles per hour during the race, while Gordon averaged 12 miles per hour. How many more minutes did it take Alexis to finish the race than it took Gordon?

- A. 40 minutes
- B. 50 minutes
- C. 80 minutes
- D. 90 minutes

11. Maria uses 0.45 m of string for each toy she makes. She has 36 m of string. How many toys can she make?

- A. 16 toys
- B. 17 toys
- C. 80 toys
- D. 81 toys

12. The table below shows the monthly profit of a sport shoe company during the first eight months after launching a new advertising campaign.

Sport Shoe Company Profits

Month	Profit (in thousands)
January	183
February	195
March	208
April	226
May	246
June	268
July	295
August	327

If the trend continues, which amount is the **best** prediction of the company's profits in September?

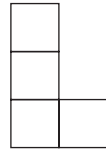
- A. \$350,000
- B. \$365,000
- C. \$385,000
- D. \$400,000

13. In Mr. Kendel's class, 12 of the 30 students are boys. Half of those boys play on the boys' basketball team. What percent of Mr. Kendel's students play on the boys' basketball team?

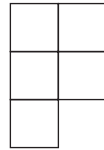
- A. 6%
- B. 12%
- C. 20%
- D. 50%



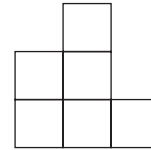
14. The figures below show the front, top, and right-side views of a three-dimensional structure that was constructed out of stacked cubes.



Front

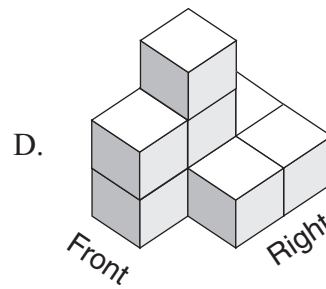
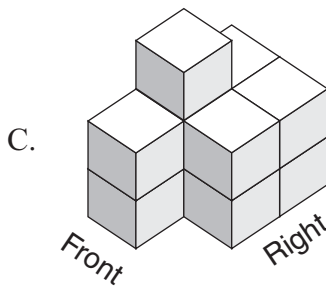
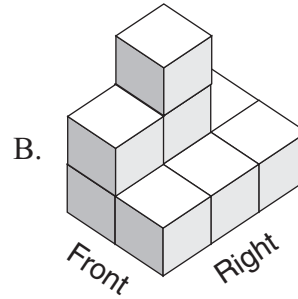
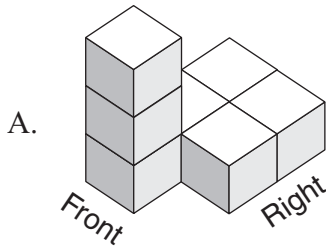


Top



Right

Which three-dimensional structure presents these views?



15. To estimate how many miles away a thunderstorm is, count the number of seconds between the sound of thunder and the next flash of lightning and divide the seconds by 5. Which equation shows the relationship between the seconds, s , and the miles, m , from a thunderstorm?

A. $m = \frac{s}{5}$

B. $m = \frac{5}{s}$

C. $s = \frac{m}{5}$

D. $s = \frac{5}{m}$

16. Angie is buying materials for a decorative wreath she will make by winding green ivy around a circular frame. The directions say that for every inch of circumference, 8 inches of ivy will be needed. If Angie's wreath has a diameter of 20 inches, what is the **least** amount of ivy she will need to complete the wreath?

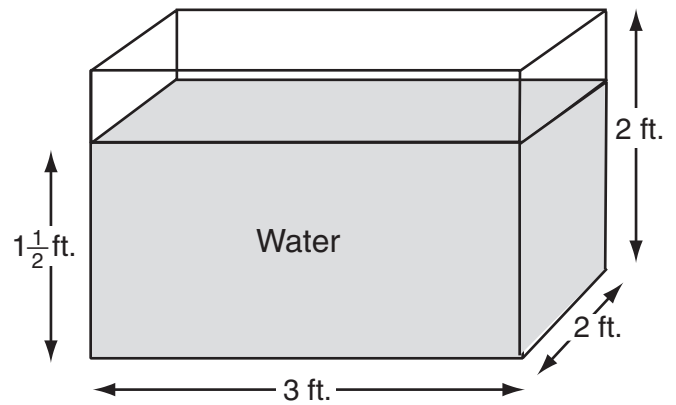
A. 252 inches

B. 503 inches

C. 1006 inches

D. 2516 inches

17. Jerry poured water to a height of $1\frac{1}{2}$ feet in a new aquarium with dimensions shown below.



One cubic foot of water weighs approximately 62 pounds. What is the weight of the water Jerry put in the aquarium?

A. 403 pounds

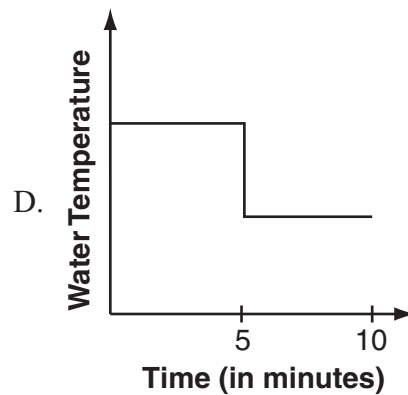
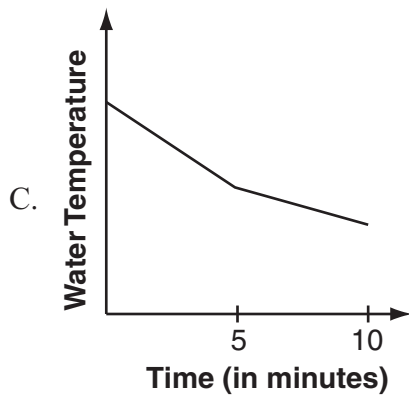
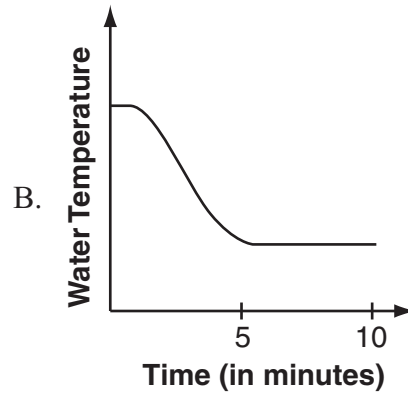
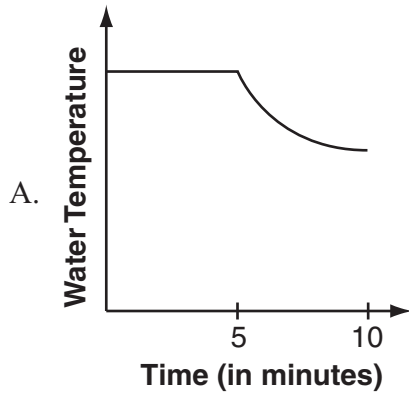
B. 465 pounds

C. 558 pounds

D. 744 pounds



18. As part of a class activity, Emily placed a thermometer in a cup of water at room temperature. After five minutes, she added ice cubes to the water. Which graph **best** represents the temperature readings from Emily's thermometer during the first ten minutes of the activity?



19. Two out of every three students at Central Junior High are on an athletic team. There are 300 students on athletic teams at the school. How many students go to Central Junior High?

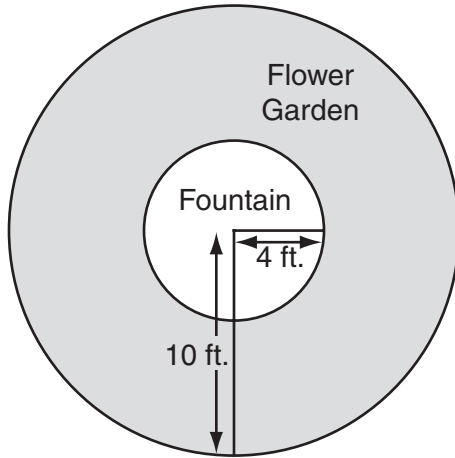
- A. 200 students
- B. 450 students
- C. 600 students
- D. 900 students

20. Which property is true for all squares but **not** true for all rhombuses?

- A. All of their angles are equal.
- B. All of their sides are equal.
- C. Their opposite sides are parallel.
- D. Their opposite sides are equal.



21. A circular flower garden surrounds a fountain as shown in the diagram below.



What is the approximate area of the flower garden?

- A. 19 square feet
- B. 38 square feet
- C. 133 square feet
- D. 264 square feet

22. Four friends perform experiments.

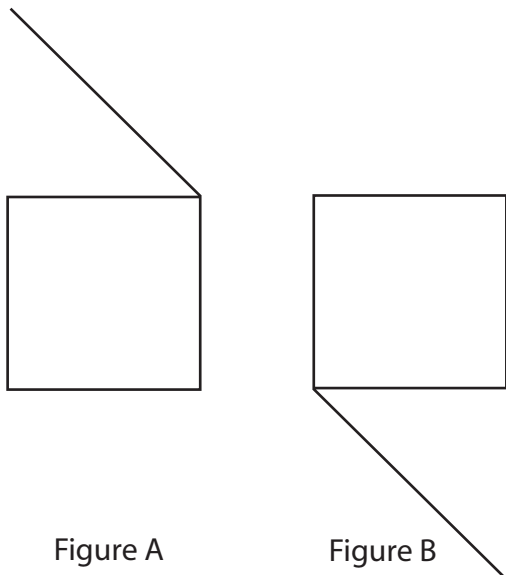
- Karen tosses a fair coin.
- Marie rolls a number cube that has the numbers 1 through 6 on its sides.
- Lucas pulls one card from a hat that contains 26 cards with a different letter of the alphabet written on each card.
- Sam pulls a marble from a bag that contains 4 black marbles and 5 red marbles.

Which event is **most likely** to occur?

- A. Karen tosses a "head."
- B. Marie rolls a number less than 5.
- C. Lucas pulls a card with a vowel written on it.
- D. Sam pulls a black marble.



23. Figure B is the image of Figure A after a transformation.



What is the transformation that was used to create Figure B?

- A. reflection
- B. rotation
- C. symmetry
- D. translation

24. Julie measured the growth of a bean plant each Saturday for five weeks. Her results are displayed in the table below.

Julie's Bean Plant

Week	Height
1	14 cm
2	18 cm
3	26 cm
4	29 cm
5	32 cm

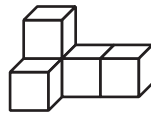
Which type of graph would be **most** appropriate to display Julie's results?

- A. a line graph
- B. a circle graph
- C. a histogram
- D. a stem-and-leaf graph



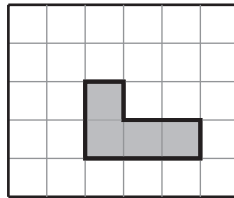
Write your answer to question 25 in the space provided for it in your Student Response Booklet. Show all of your work.

25. Martin built the structure shown below with five cubes.



Front

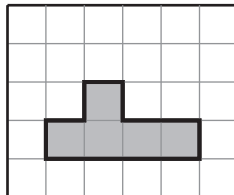
The front view of his structure is shown below.



Martin's Front View

- a. On the grid in your Student Response Booklet, draw the top view of Martin's five-cube structure. Label your drawing part a.

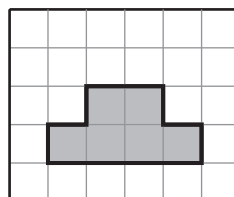
Linda built a different structure with six cubes. The front view of her structure is shown below.



Linda's Front View

- b. On the grid in your Student Response Booklet, draw one possible top view of Linda's six-cube structure. Label your drawing part b.
- c. On the grid in your Student Response Booklet, draw the view from the right or left side of the six-cube structure. Label your drawing part c.

James thinks this could be a top view of Linda's structure.



James's Top View

- d. Explain why James's top view is not possible for Linda's six-cube structure.

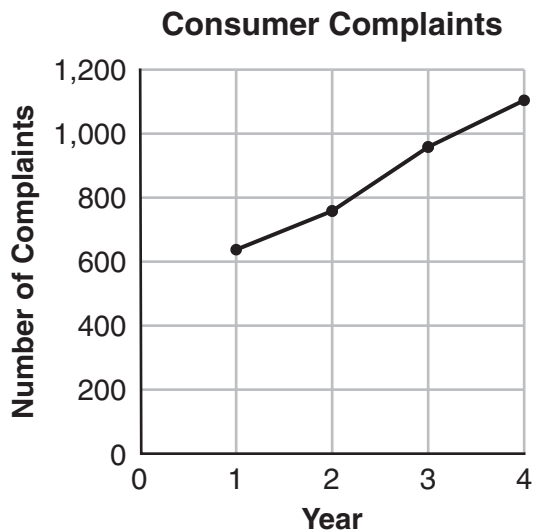
Mathematics

Session 2A (Calculator)

This test session includes multiple-choice questions. You may use a calculator during this session.

Mark your answers to questions 26 through 30 in the section marked "Mathematics—Session 2A (Calculator)" in your Student Response Booklet.

26. The graph below shows the number of consumer complaints for an airline. The airline has been in business for four years.



Which statement about the data in the graph is the most accurate?

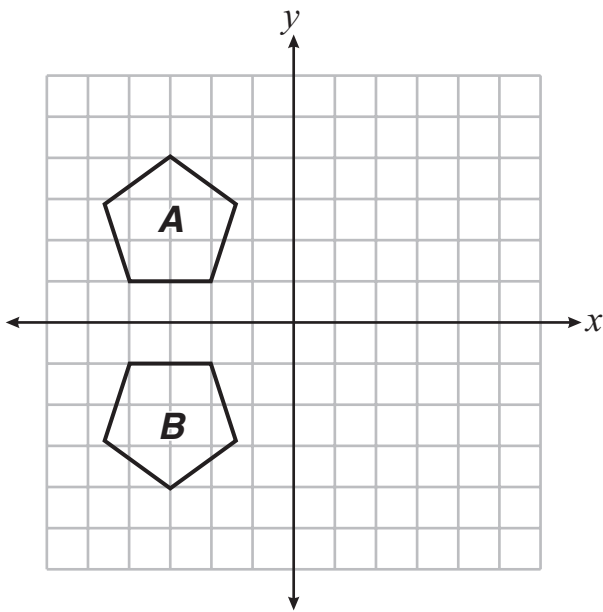
- A. Consumer complaints doubled the second year.
- B. Consumer complaints for this airline are above the industry average.
- C. Consumer complaints are increasing steadily.
- D. Consumer complaints increase some years and decrease some years.

27. The city council wants to conduct a survey to find out if a new gas station is needed. The council members want to be sure to get fair survey results. Who should they survey?

- A. morning bus drivers
- B. ten people from each neighborhood
- C. owners of three or more cars
- D. owners of subcompact cars

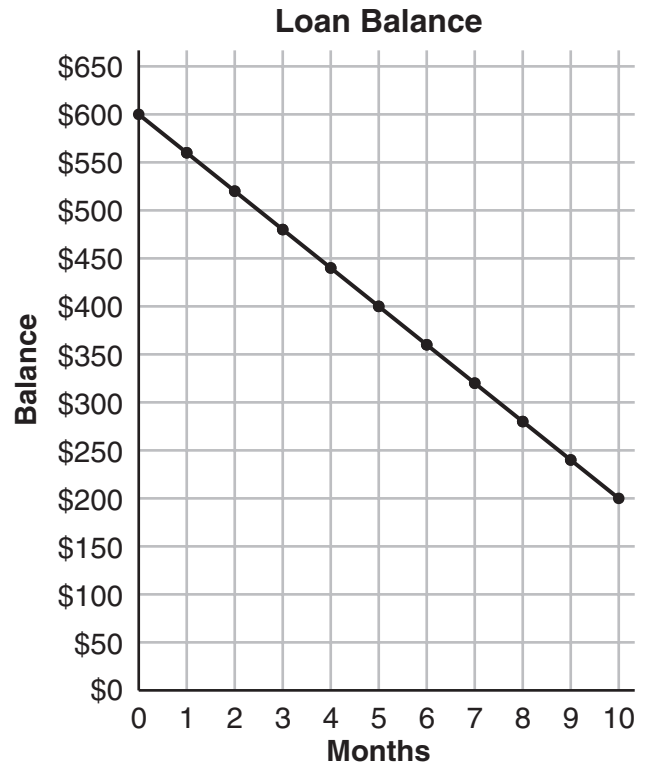


Use the diagram below to answer question 28.



28. For which transformation is figure *B* the image of figure *A*?
- reflection over the *x*-axis
 - reflection over the *y*-axis
 - 180° counterclockwise rotation with its center at the origin
 - 90° clockwise rotation with its center at the origin
29. Sandra is driving to Easton, which is 285 miles from her home. She drove 171 miles in the first 3 hours. If she continues at the same speed, how much longer will it take her to get to Easton?
- 1 hour, 12 minutes
 - 1 hour, 20 minutes
 - 2 hours
 - 5 hours

30. Pat got a loan of \$600 to buy a washing machine. The graph shows the balance (the amount he owes on the loan) when he makes monthly payments.



Which equation shows the balance, *b*, after *m* monthly payments?

- $b = 40m$
- $b = 600$
- $b = 600 - m$
- $b = 600 - 40m$

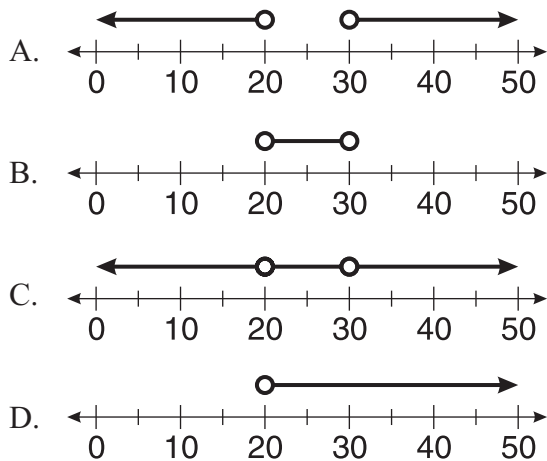
Mathematics

Session 2B (No Calculator)

This test session includes multiple-choice questions. You may NOT use a calculator during this session.

Mark your answers to questions 35 through 38 in the section marked "Mathematics—Session 2B (No Calculator)" in your Student Response Booklet.

35. The volleyball team members want to buy the coach a gift. The amount of money they spend, s , must satisfy two limits: $s > 20$ and $s < 30$. Which graph shows how much they can spend?

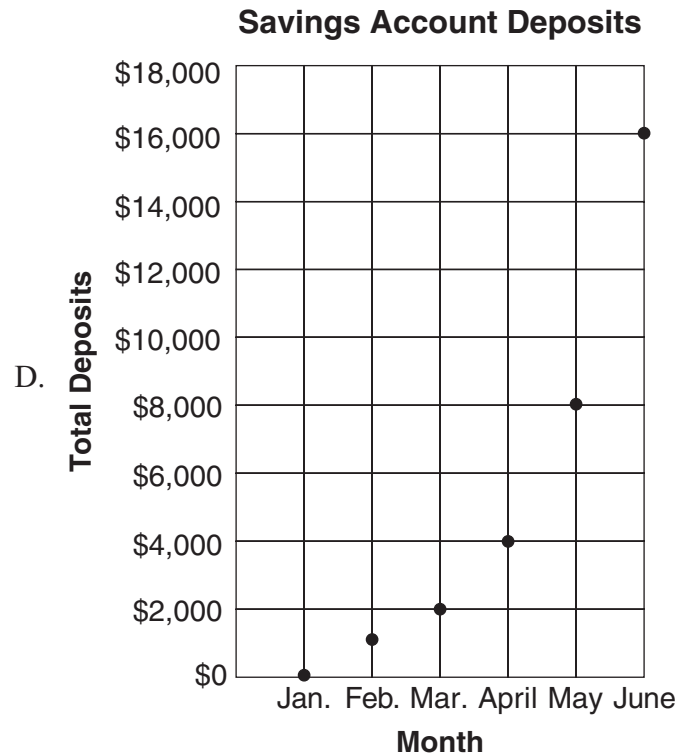
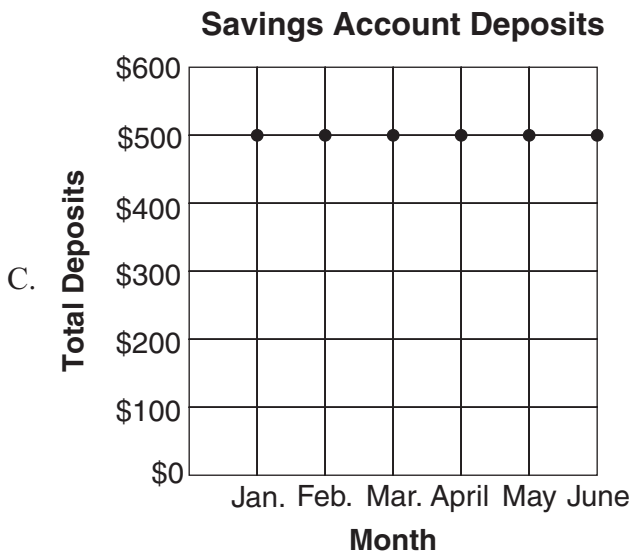
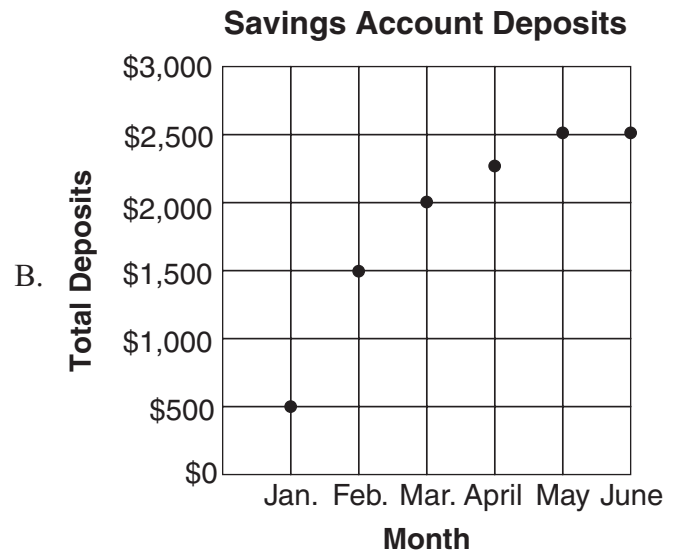
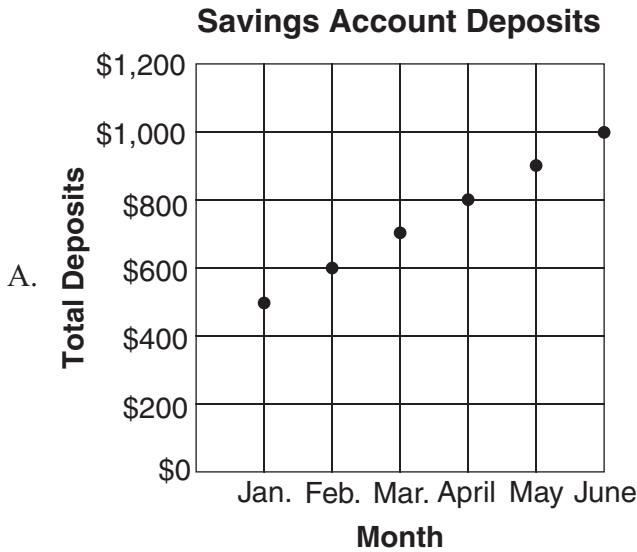


36. Samantha is drawing a triangle. So far she has drawn two angles that each measure 60 degrees. Which kind of triangle will Samantha have when she is finished?

- A. right
- B. scalene
- C. obtuse
- D. equilateral



37. In January, Ella started a savings account with a \$500 deposit from a gift she received from her aunt. Each month after that, she made equal deposits of money she earned from an after-school job. She made a graph to show how much money she deposited altogether. Which graph shows Ella's record of deposits?



38. Jason used 6.2 gallons of gas to drive 178 miles. Which of the following is the best estimate for Jason's mileage rate in miles per gallon?
- A. 20 miles per gallon
 - B. 25 miles per gallon
 - C. 30 miles per gallon
 - D. 35 miles per gallon

39. Item not scored

Mathematics

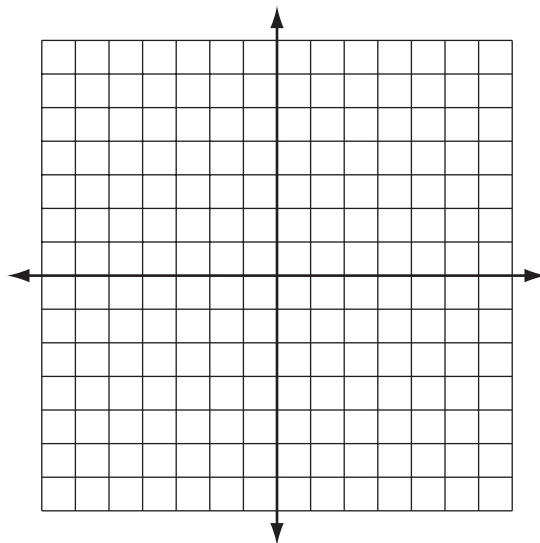
Session 3 (No Calculator)

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. Wilma planted a sunflower seed in her garden. If the sunflower grows 3 inches each week, how tall will it be after 14 weeks?
- A. 17 inches
 - B. 32 inches
 - C. 42 inches
 - D. 45 inches

You may use the coordinate grid below to answer question 45.



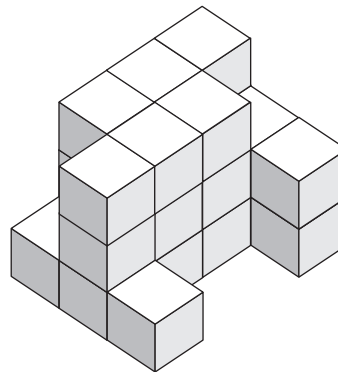
45. Brenda drew a rectangle on a coordinate grid. Two of the corners of her rectangle are located at the points $(-30, -50)$ and $(20, -50)$. If the rectangle is 50 meters by 100 meters, at which point could a third corner of Brenda's rectangle be located on the coordinate grid?
- A. $(20, 0)$
 - B. $(-30, 50)$
 - C. $(70, -50)$
 - D. $(120, 50)$



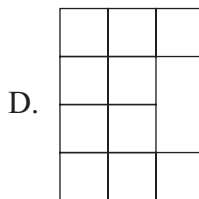
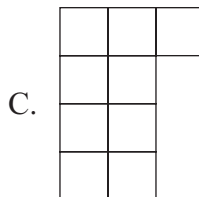
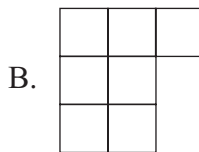
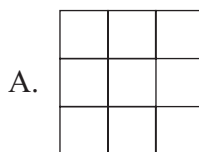
46. Candice got 28 questions correct on a 35-question vocabulary quiz. Which proportion can she use to calculate the percent, P , she got correct?

- A. $\frac{28}{35} = \frac{P}{100}$
- B. $\frac{28}{35} = \frac{100}{P}$
- C. $\frac{28}{100} = \frac{P}{35}$
- D. $\frac{35}{100} = \frac{P}{28}$

47. This three-dimensional structure was constructed out of stacked cubes.



Which picture could show the top view of the structure?



48. Jamie learned that the average distance from Saturn to the Sun is 1,426,980,000 kilometers. How should Jamie write this distance in scientific notation?
- A. 1.42698×10^4 km
 B. 1.42698×10^6 km
 C. 1.42698×10^9 km
 D. 1.42698×10^{10} km
49. The Blake family spends 12% of their income on travel. What fraction of their income is spent on travel?
- A. $\frac{1}{12}$
 B. $\frac{3}{25}$
 C. $\frac{1}{6}$
 D. $\frac{6}{25}$

50. A bag contains red, blue, and green tokens. Don randomly chooses one token from the bag, records the color, and replaces the token before choosing another token. He performs the experiment 100 times. The final tally of his results is shown in the table below.

Don's Experiment

Color of Token	Tally
Red	
Blue	
Green	

Based on Don's data, what is the probability of randomly choosing a red token from the bag?

- A. $\frac{4}{25}$
 B. $\frac{4}{21}$
 C. $\frac{1}{5}$
 D. $\frac{1}{4}$



51. Kayla and her friends played a game. Their scores are shown below.

23 37 41 20 43 21 32 25 20 40 41 34 41 37

Which stem-and-leaf graph correctly represents their scores?

A.

2	0	1	3	5
3	2	4	7	
4	0	1	3	

B.

2	0	0	1	3	5
3	2	4	7	7	
4	0	1	1	1	3

C.

20	0	1	3	5
30	2	4	7	
40	0	1	3	

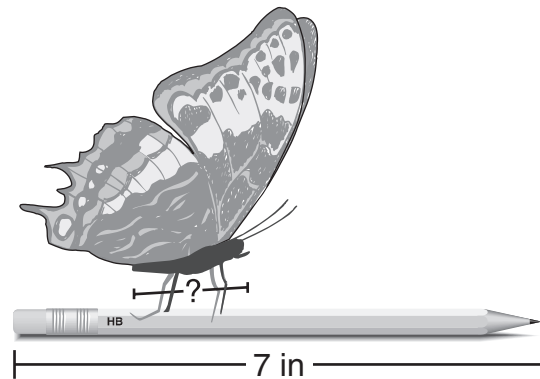
D.

20	0	0	1	3	5
30	2	4	7	7	
40	0	1	1	1	3

52. A quadrilateral has sides with the lengths $\sqrt{6}$ cm, π cm, 3^2 cm, and 3.2 cm. What is the length of the longest side?

- A. $\sqrt{6}$ cm
 B. π cm
 C. 3^2 cm
 D. 3.2 cm

53. The figure below shows a butterfly on a 7-inch-long pencil.



Which is the **best** estimate of the length of the butterfly's body?

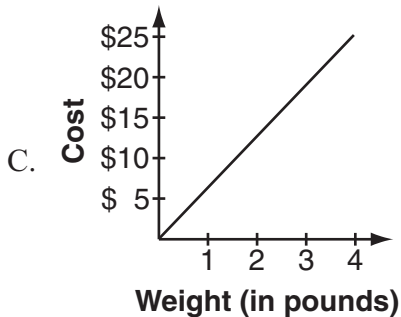
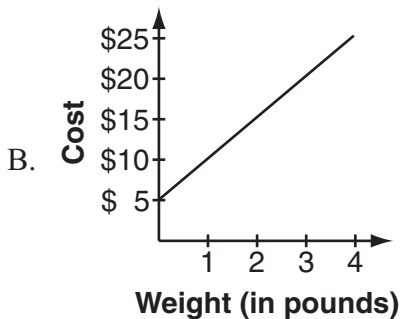
- A. $\frac{1}{2}$ inch
 B. $1\frac{1}{2}$ inches
 C. $2\frac{1}{2}$ inches
 D. $3\frac{1}{2}$ inches



54. The table below shows the costs of different weights of fudge at the Sweet Shop.

Weight	Cost
1 pound	\$ 5
2 pounds	\$10
3 pounds	\$15
4 pounds	\$20

Which graph **best** shows the relationship between the fudge's weight and its cost?



55. A right triangular prism has which of the following?

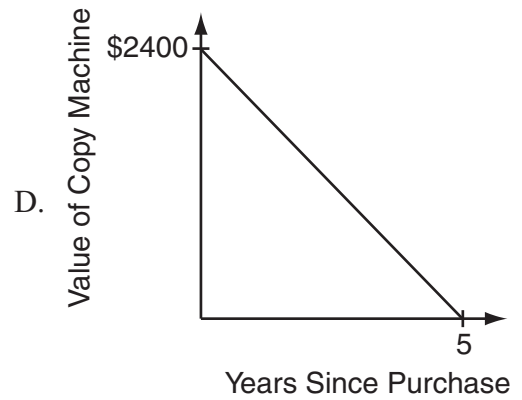
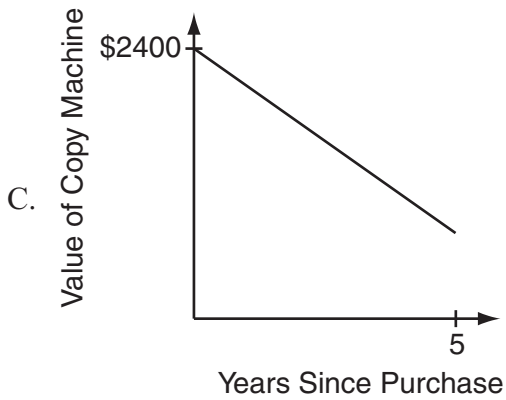
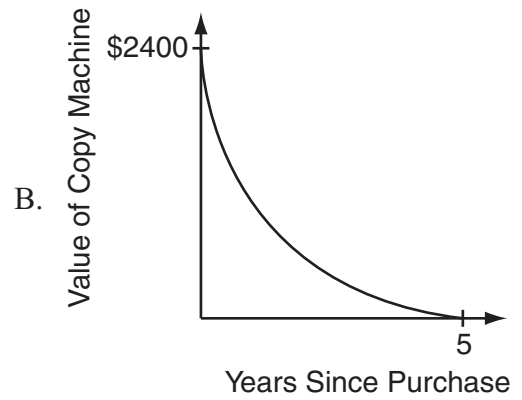
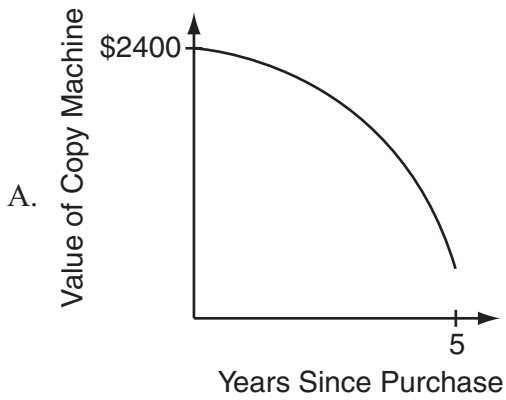
- A. exactly one rectangular face
- B. exactly three rectangular faces
- C. exactly three triangular faces
- D. exactly four triangular faces

56. Bananas are on sale for \$0.29 per pound. Tracy chose 2 bunches of them. One bunch weighs 1.8 pounds and the other weighs 2.2 pounds. Which expression could she use to calculate the total cost of buying the bananas?

- A. $0.29(1.8 + 2.2)$
- B. $0.29(1.8 \cdot 2.2)$
- C. $0.29 + (1.8 + 2.2)$
- D. $0.29 + (1.8 \cdot 2.2)$

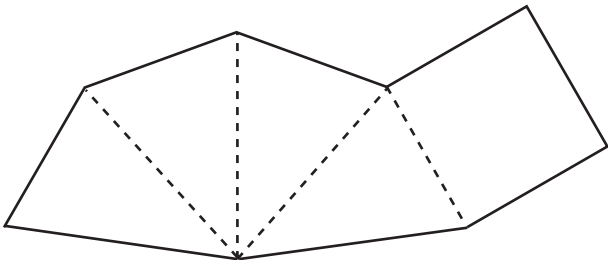


57. A company purchased a copy machine for \$2400. The copy machine will decrease in value at a rate of \$480 each year. Which graph **best** represents the value of the copy machine during the first five years after it is purchased?



58. Teresa burns 450 calories per hour when she plays racquetball. What is the best estimate of the number of calories she burns playing racquetball for 22 minutes?
- 100
 - 150
 - 225
 - 275

59. Jonathon cut out the pattern shown below and folded it along the dotted lines to make a three-dimensional figure.

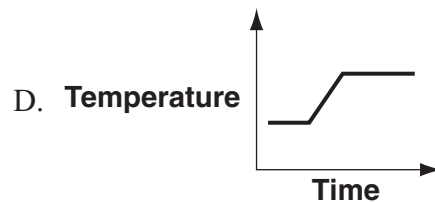
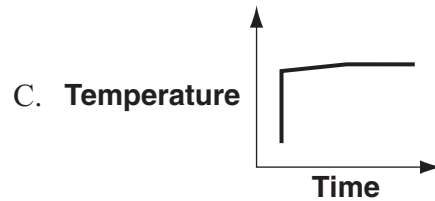
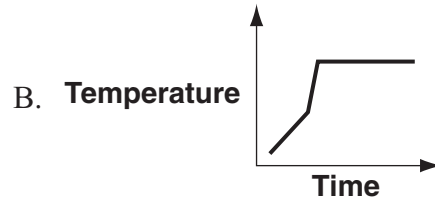
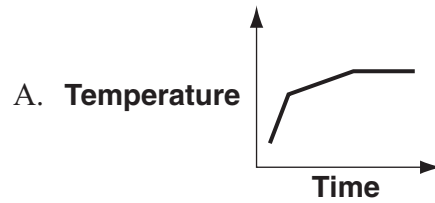


Which three-dimensional figure did he make?

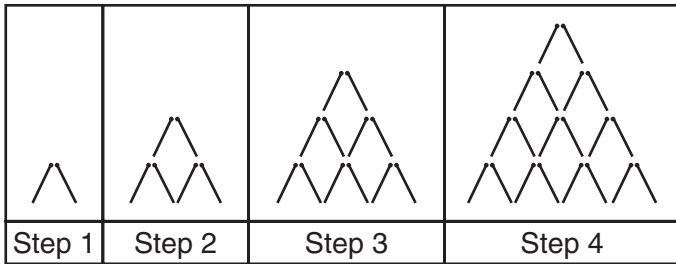
- a square prism
- a square pyramid
- a triangular prism
- a triangular pyramid

60. Nina took these notes on how to perform a science experiment.
- Heat the substance so that it reaches 100°F quickly.
 - Reduce the heat so that the substance's temperature slowly increases to 150°F .
 - Further reduce the heat to maintain the temperature at 150°F .

Which graph **best** represents the desired temperature changes?



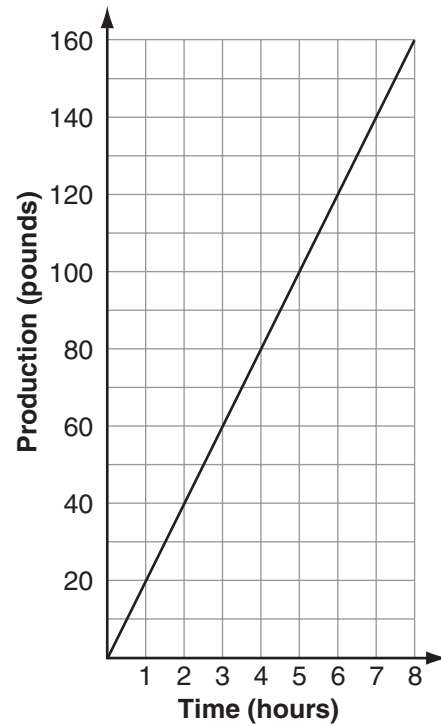
61. Kevin is making a pattern out of matchsticks. The first four steps of his pattern are shown below.



How many matchsticks does Kevin need for Step 6?

- A. 30
- B. 32
- C. 40
- D. 42

62. The graph below shows the production of one machine at a candy factory during an eight-hour day.



Which equation shows the relationship between production, P , and time, t , shown in the graph?

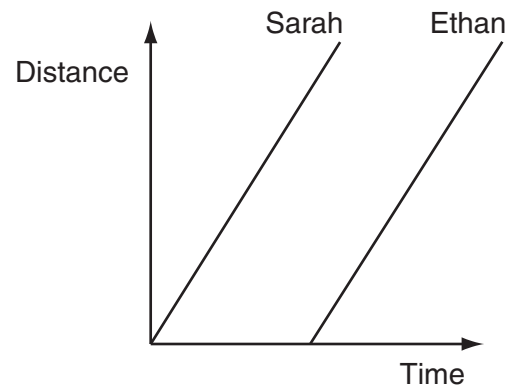
- A. $P = 2t$
- B. $P = 20t$
- C. $P = 2 + t$
- D. $P = 20 + t$



63. Mr. Jackson pays \$650 rent each month to live in his apartment. For each day his rent check is late, he must pay an extra \$5. Which expression represents the amount of money Mr. Jackson would need to pay if his rent check was x days late?

- A. $5x$
- B. $650 + 5x$
- C. $650x + 5$
- D. $650 + 5 + x$

64. Sarah and her brother Ethan walk to school every morning but not always together. The graph below shows the distance each child walked from their house over time Monday morning.



Which sentence **best** describes the situation represented by the graph?

- A. Sarah and Ethan walked at the same rate, but Ethan left later than Sarah did.
- B. Sarah and Ethan walked at the same rate, but Sarah left later than Ethan did.
- C. Sarah and Ethan left at the same time, but Sarah walked faster than Ethan did.
- D. Sarah and Ethan left at the same time, but Ethan walked faster than Sarah did.



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

65. Solve for x :

$$35x + 70 = 280$$

66. If $x = 6$ and $y = \frac{1}{3}$, what is the value of W in the equation $W = 8x^2y$?

67. 18 is 30% of what number?



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

68. Think of the meaning of the range, median, mean (average), and mode of a list of numbers.
- Make a list of five numbers that have a range of 10 and a median of 8.
 - Make a list of five numbers that have a mode of 7 and a mean of 6.
 - Make a list of five numbers that have a median of 4, a mode of 8, and a mean of 5.