Student Name:
School Name:
Teacher/Class:

Montana Comprehensive Assessment System (MontCAS CRT)

Grade 8
Common Released Items
Spring 2009

OPI

OFFICE OF PUBLIC INSTRUCTION

Mathematics
Session 1 (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 in the section marked "Mathematics—Session 1 (No Calculator)" in your Student Response Booklet.

1. Helium freezes at –272.05°C. Krypton freezes at a temperature that is 114.83°C warmer than the freezing point of helium. What is the freezing point of krypton?

   A. –386.88°C
   B. –157.22°C
   C. 157.22°C
   D. 386.88°C

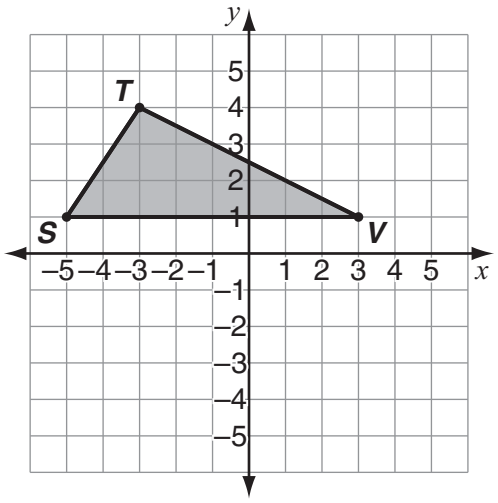
3. Use the numbers below to answer the question.

   $$3.8 \quad \sqrt{12} \quad \frac{11}{3}$$

   Which list shows the numbers ordered from **least to greatest**?

   A. $\sqrt{12}, \frac{11}{3}, 3.8$
   B. $\sqrt{12}, 3.8, \frac{11}{3}$
   C. $3.8, \sqrt{12}, \frac{11}{3}$
   D. $3.8, \frac{11}{3}, \sqrt{12}$

9. Study triangle *STV* below.



   What is the length of the altitude (height) drawn from vertex *T*?

   A. 3 units
   B. 4 units
   C. 6 units
   D. 8 units

10. The population of China is approximately 1.3 **billion** people. Finland has a population of approximately 5.2 **million** people. Approximately how many more people live in China than in Finland?

    A. 3,900,000,000
    B. 1,295,000,000
    C. 129,500,000
    D. 3,900,000

Please go on to the next page.

16. The books in a library are being moved to a new location. The library contains approximately

- 13,800 fiction books,
- 11,600 nonfiction books, and
- 2,280 resource books.

Approximately 30 books can be packed into each packing carton. Which is the **best** estimate for the number of packing cartons needed to pack all of the library books?

A. 100
B. 200
C. 1,000
D. 2,000

Write your answers in the spaces provided in your Student Response Booklet. Show all of your work.

19. What is the value of the expression below when $t = 3$ and $v = 80$?

$$16t^2 + vt$$

20. Solve for b:

$$5b - 10 = 55$$

23. Sample 1 of a silver alloy weighs 100 ounces and contains 20% pure silver.

a. How many **ounces** of pure silver does sample 1 contain?

b. Sample 2 of a silver alloy weighs 320 ounces and is 75% pure silver. How many ounces of sample 2 are **not** pure silver?

c. Sample 3 is made by combining 60 ounces of pure silver with sample 1. What is the **percent** of pure silver in sample 3? Show or explain how you found your answer.

Please STOP. Do not go on to the next page.

Mathematics
Session 2 (Calculator)

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

Mark your answers in the section marked "Mathematics—Session 2 (Calculator)" in your Student Response Booklet.

24. The student ratio of **men to women** at a university is 3 to 7. There are currently 2135 women at the university. Which proportion could be used to determine the number of men at the university?

A. $\frac{3}{7} = \frac{2135}{x}$

B. $\frac{3}{7} = \frac{x}{2135}$

C. $\frac{3}{2135} = \frac{7}{x}$

D. $\frac{7}{2135} = \frac{x}{3}$

25. Study the statement below.

> A diagonal of a quadrilateral always divides the quadrilateral into two congruent triangles.

Which quadrilateral will prove this statement false?

A. rectangle

B. rhombus

C. square

D. trapezoid

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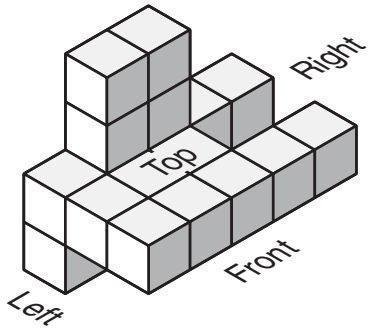
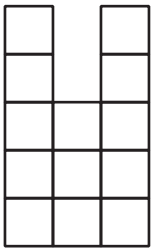
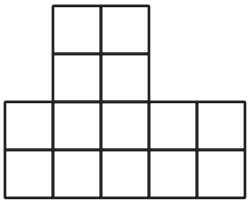
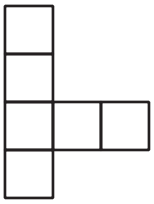
28. Study the figure below.

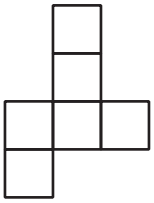


Which view is the **left side** of the figure?

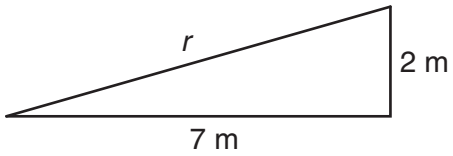
A. 

B. 

C. 

D. 

30. Tyrone built the ramp shown below.



To the nearest tenth of a meter, what is the length, *r*, of the ramp?

A. 6.7 m
B. 7.3 m
C. 9.0 m
D. 18.0 m

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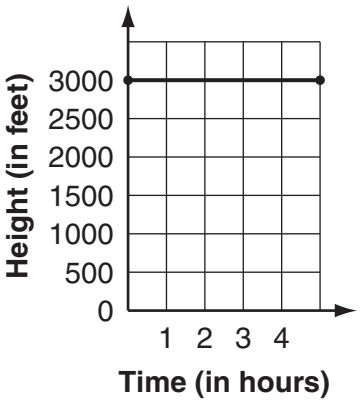
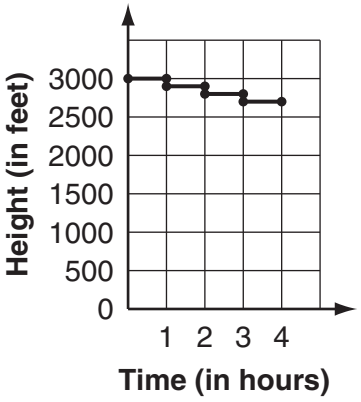
35. A hot-air balloon is 3000 feet high in the air. It will descend at a constant rate of 100 feet per hour. Which graph **best** represents the height of the balloon over time?

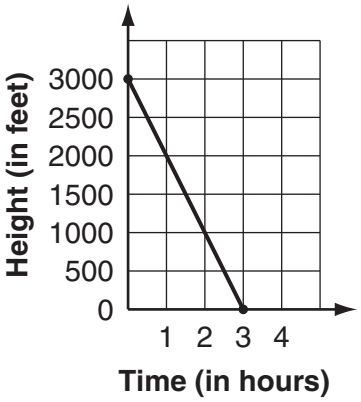
A.



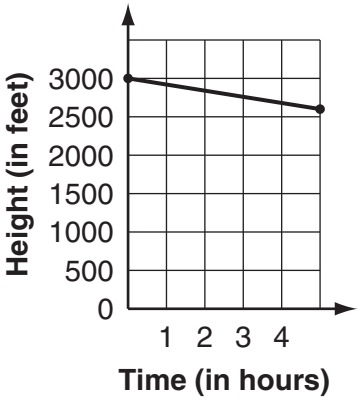
B.



C.



D.



39. At Brodie's fitness club, there is a monthly $25 fee and an additional $5 charge for each class he takes. Which equation represents the monthly cost, m, if Brodie takes x classes?

A. $m = 5x - 25$

B. $m = 25 + 5x$

C. $x = 25 + 5m$

D. $x = 25m - 5$

40. Study the pattern in the table below.

x	y
1	1
2	0.5
3	0.25
4	0.125
5	

What is the value of y when $x = 5$?

A. 0.00125

B. 0.0125

C. 0.0625

D. 0.625

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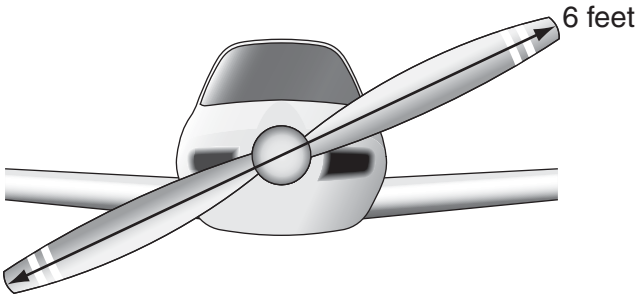
41. The distance from tip to tip of the airplane propeller shown below is 6 feet.



To the nearest foot, what is the circumference the tips of the propeller cover when the propeller is spinning? [$\pi = 3.14$]

A. 19 feet
B. 28 feet
C. 38 feet
D. 113 feet

42. Which expression is equivalent to $12x + 16$?

A. $2(6x + 16)$
B. $3(4x + 4)$
C. $4(3x + 4)$
D. $12(x + 16)$

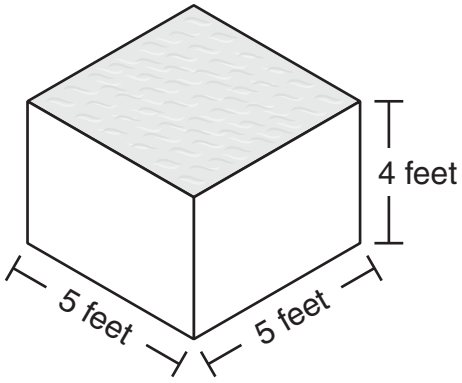
44. Students at a local college were asked how many hours they slept the night before. The chart below shows these data.

Hours of Sleep	Number of Students
6	14
7	26
8	28
9	15
More than 10	6

A bar graph of these data will be made on a grid that is 20 units by 20 units. Which scale would be **most** appropriate for the axis labeled "Number of Students"?

A. 1 unit = 1 student
B. 1 unit = 2 students
C. 1 unit = 10 students
D. 1 unit = 28 students

45. The measurements of a container are shown below.



How many **gallons** of water does the container hold?
(Hint: 1 cubic foot = 7.48 gallons)

A. 100 gallons
B. 105 gallons
C. 748 gallons
D. 972.4 gallons

Please STOP. Do not go on to the next page.

STOP

Mathematics
Session 3 (Calculator)

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

Mark your answers in the section marked "Mathematics—Session 3 (Calculator)" in your Student Response Booklet.

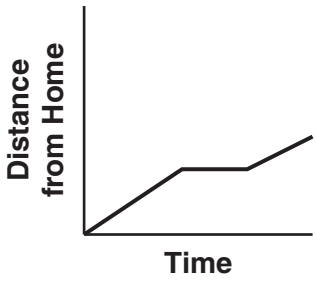
50. Which solid does **not** have at least one pair of parallel faces?

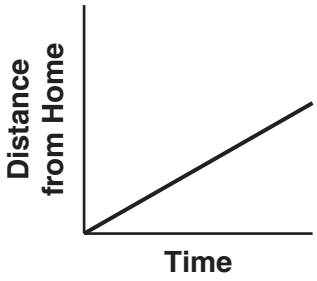
A. cube
B. cylinder
C. rectangular pyramid
D. triangular prism

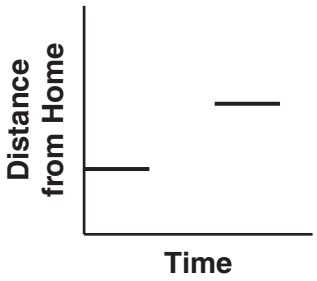
51. A model of an aircraft carrier was made using the scale 1:350. The length of the model is 36 inches. What is the actual length, **in feet**, of the aircraft carrier?

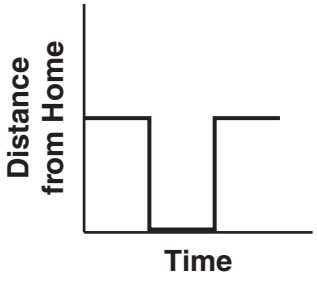
A. 12,600
B. 4,200
C. 1,386
D. 1,050

53. Jeremy drove for three hours heading away from home, stopped for one hour, and then drove for another two hours in the same direction. Which graph **best** represents Jeremy's distance from home over time?

A.


B.


C.


D.


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57. What is the greatest number of lines of symmetry a rhombus can have?

A. 2
B. 3
C. 4
D. 8

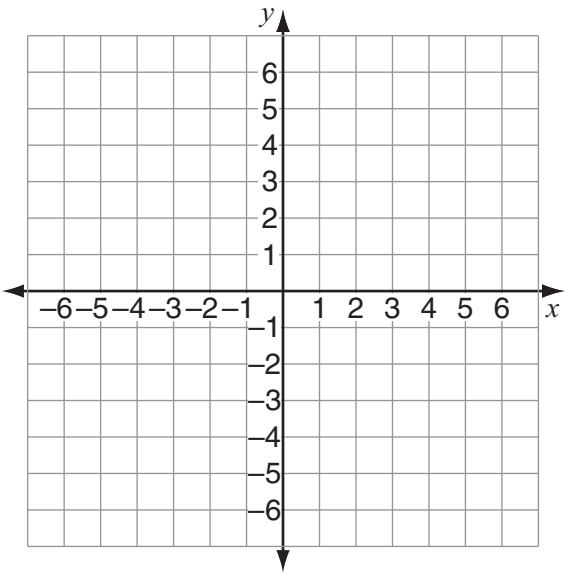
58. Bill has a bag containing red marbles, blue marbles, and green marbles. He pulled one marble out of the bag, recorded the color, and then replaced the marble in the bag. Bill did this several times. During this experiment, he pulled out

- a red marble 40 times,
- a blue marble 80 times, and
- a green marble 140 times.

Based on the data, what is the probability that Bill will pull out a blue marble on the next try?

A. $\frac{4}{13}$
B. $\frac{4}{9}$
C. $\frac{9}{13}$
D. $\frac{9}{4}$

61. You may use the coordinate grid below to answer this question.



Point L is located at (–3, –5). Point L is reflected over the y-axis. What are the coordinates of the image of point L?

A. (3, 5)
B. (3, –5)
C. (–3, 5)
D. (–3, –5)

62. A survey was taken to determine the favorite books read by the middle school students in Montana. The survey used a sample of 25 students in one eighth-grade class as the basis for its findings. Which statement **best** describes what was wrong with the survey?

A. The sample was too small.
B. One eighth-grade class didn't represent all middle school students.
C. The sample was too small and didn't represent the entire state middle school population.
D. The survey didn't provide a list of books to choose from.

Please go on to the next page.

65. The table below shows the daily sales record for a fruit stand.

Day	Sales
Monday	$28
Tuesday	$32
Wednesday	$47
Thursday	$14
Friday	$55
Saturday	$70

If the lowest number in the table is dropped, by how much will the median change?

A. $ 5.40
B. $ 7.50
C. $39.50
D. $47.00

68. A spinner has an area of 80 square inches. The table below shows the amount of the spinner's area covered by each of four colors.

Color	Amount of Spinner Area (in square inches)
Red	16
Blue	32
Green	12
Yellow	20

If the spinner is spun 50 times, which is the **best** estimate for the number of times it will land on blue?

A. 18 times
B. 20 times
C. 32 times
D. 40 times

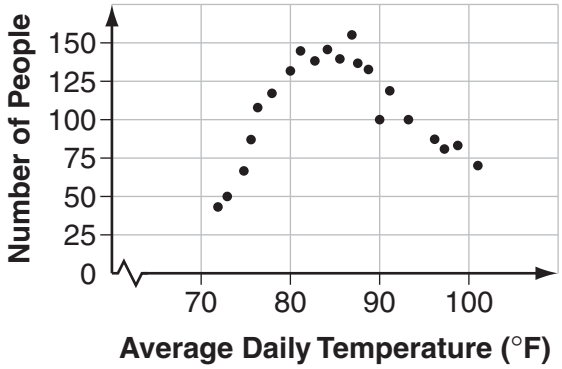
70. Study the table below.

Term (t)	Number
1	22
2	24
3	26
4	28

Which expression represents the number for Term t?

A. $t + 2$
B. $2t$
C. $2t + 20$
D. $20t + 2$

71. The scatter plot below shows the attendance at a municipal pool for various average daily temperatures.



Based on the scatter plot, when the average daily temperature is 95°F, which is the **best** prediction for the number of people who will use the municipal pool that day?

A. 50
B. 80
C. 110
D. 150

Please STOP. Do not go on to the next page.

STOP