

# *Montana Comprehensive Assessment System (MontCAS CRT)*

GRADE 8  
COMMON RELEASED ITEMS  
SPRING 2011



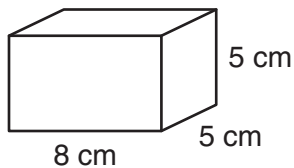
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Montana  
**Office of Public Instruction**  
Denise Juneau, State Superintendent

## Mathematics (No Calculator)

1. What is  $\frac{34}{40}$  expressed as a percent?
  - A. 34%
  - B. 40%
  - C. 85%
  - D. 94%
  
2. A cabinetmaker can construct between 25 and 30 cabinets a month. Which is the **best** estimate of the number of cabinets the cabinetmaker can construct in  $6\frac{1}{2}$  months?
  - A. 150
  - B. 180
  - C. 210
  - D. 300
  
3. Jason drives 25 miles to work each day. His car has a 30-gallon gas tank and averages 19.2 miles per gallon. Jason filled the gas tank and then drove to work and home again. Which expression can be used to calculate how many gallons of gas **remain** in his car's tank?
  - A.  $2[30 - (19.2)(25)]$
  - B.  $30 - \frac{2(25)}{19.2}$
  - C.  $30 - (19.2)(25)(2)$
  - D.  $2\left(30 - \frac{25}{19.2}\right)$

4. Study the shape below.



Which pattern (net) will fold into the shape?

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

5. Which list has the numbers in order from **least** to **greatest**?

- A.  $\frac{8}{3}$ , 275%,  $\frac{14}{5}$   
 B.  $\frac{8}{3}$ ,  $\frac{14}{5}$ , 275%  
 C.  $\frac{14}{5}$ ,  $\frac{8}{3}$ , 275%  
 D. 275%,  $\frac{14}{5}$ ,  $\frac{8}{3}$

6. The stem-and-leaf plot below shows the points scored by the members of a basketball team in their last game.

0	1 2 4 4
1	0 2 4 4 5
2	0 0 8

**Key:** 1|4 = 14 points

What is the median number of points scored in the game?

- A. 12  
 B. 13  
 C. 19  
 D. 20
7. If  $m < 0$ , which statement is **always** true?
- A.  $m^2 < 0$   
 B.  $m^2 > 1$   
 C.  $m^2 < m$   
 D.  $m^2 > m$

8. Write the prime factorization of 60.

9. Add.

$$-\frac{5}{6} + \frac{3}{4}$$

## Mathematics (Calculator)

10. A pharmaceutical company manufactures capsules for certain medications. Which measurement would the company **most likely** use to measure the mass of the medication for each capsule?

A. milligrams  
B. kilograms  
C. milliliters  
D. kiloliters

11. The table below shows the number of calories burned during different activities.

**Calories Burned per Hour of Activity**

<b>Activity (1 hour)</b>	<b>130- pound person</b>	<b>155- pound person</b>	<b>190- pound person</b>
Aerobics	354	422	518
Badminton	413	493	604
Bicycling <10mph	236	281	345
Bicycling >20mph	944	1126	1380
Bowling	177	211	259

Based on the table, which statement is true?

- A. Everyone burns calories at the same rate while doing any one activity.  
B. Bicycle speed does not change the number of calories burned.  
C. Playing badminton burns fewer calories than bowling.  
D. Doing aerobics burns about twice as many calories as bowling.

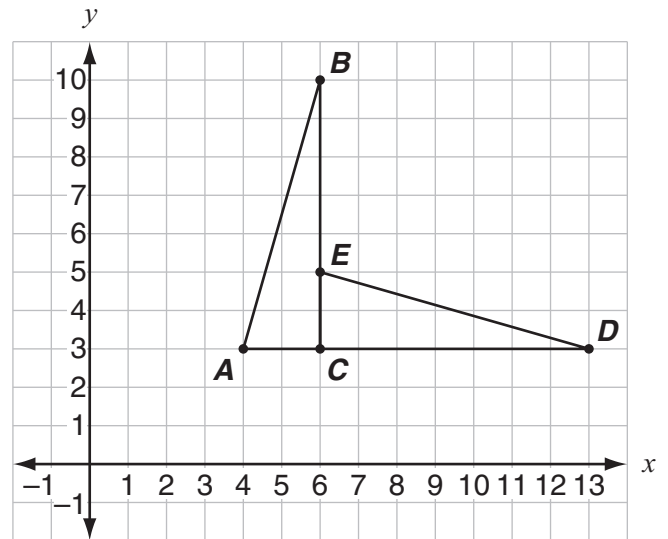
12. Which expression is equivalent to  $xy + x(y + 1) + 2xy$ ?

- A.  $2xy + 1$
- B.  $4xy + 1$
- C.  $4xy + x$
- D.  $5xy$

13. An 8-ounce serving of yogurt contains 36% of the recommended daily amount of calcium. What percent of the recommended daily amount of calcium is in a 6-ounce container of the same yogurt?

- A. 27%
- B. 30%
- C. 34%
- D. 48%

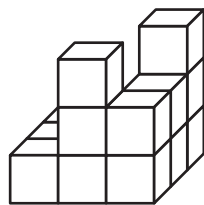
14. A rotation of triangle  $ABC$  results in the image, triangle  $EDC$ , shown below.



Which phrase describes this rotation?

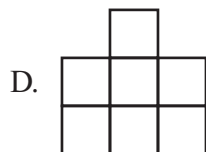
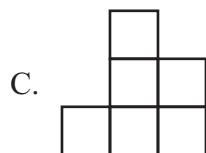
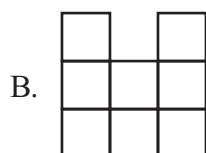
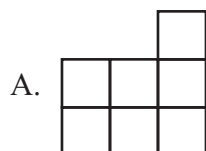
- A.  $90^\circ$  clockwise about point  $C$
- B.  $90^\circ$  clockwise about the origin
- C.  $90^\circ$  counterclockwise about point  $C$
- D.  $90^\circ$  counterclockwise about the origin

15. The structure shown below is made of 13 cubes.

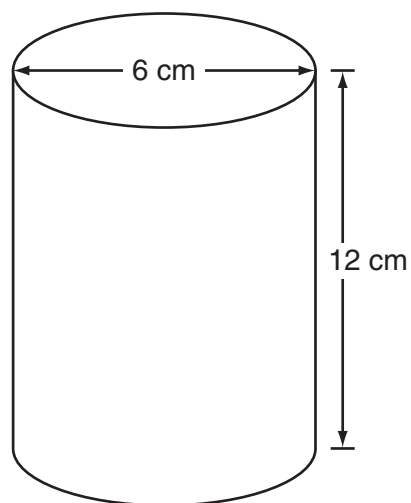


Front

What is the right side view of this structure?



16. A cylindrical can is shown below.



The can has no overlaps. How much material, to the nearest square centimeter, is needed to make this cylindrical can? (Note: Use 3.14 for  $\pi$ .)

- A. 283  $\text{cm}^2$   
 B. 339  $\text{cm}^2$   
 C. 678  $\text{cm}^2$   
 D. 1356  $\text{cm}^2$

17. Study the pattern below.

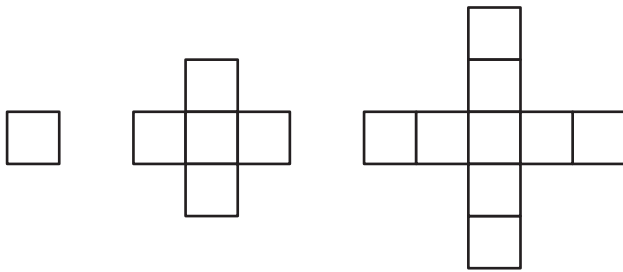


Figure 1

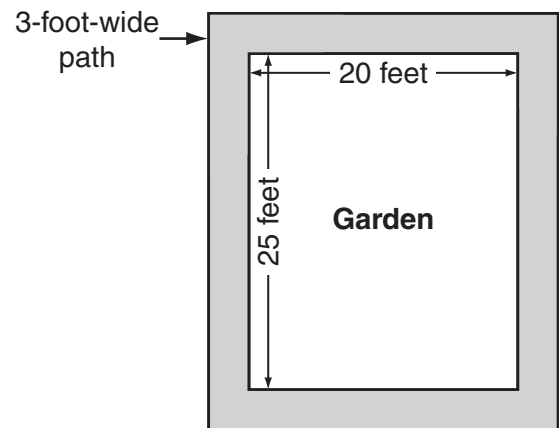
Figure 2

Figure 3

How many squares will be in Figure 50?

- A. 53
- B. 170
- C. 197
- D. 625

18. Lindsay is putting a 3-foot-wide path around the outside of her rectangular garden as shown below.



What is the area of the path around the garden?

- A. 144 square feet
- B. 270 square feet
- C. 306 square feet
- D. 342 square feet

19. Triangle  $JKL$  is reflected across the  $x$ -axis. The coordinates of point  $J$  are  $(3, 5)$ . What are the coordinates of the image of point  $J$ ?

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



20. Study the pattern below.

4, 13, 40, 121, 364, ...

What is the rule for finding the next number in this pattern?

- A. Add 9 to the previous number.
  - B. Square the previous number, then subtract 3.
  - C. Multiply the previous number by 2, then add 5.
  - D. Multiply the previous number by 3, then add 1.
21. Mrs. Carson drives her son and 3 other children to school each morning. She has 4 available passenger seats in her car. In how many different arrangements can her son and the other children sit in Mrs. Carson's car?
- A. 4
  - B. 6
  - C. 10
  - D. 24

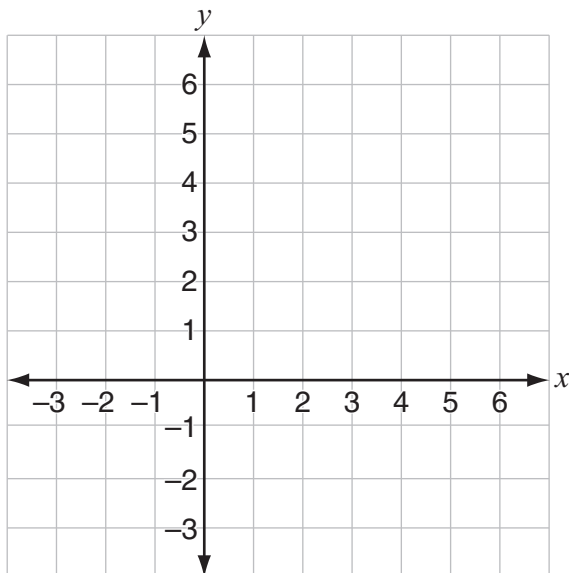
22. A payroll clerk uses the following expression to calculate the total pay of an employee who worked 40 hours at the hourly rate of  $p$  and  $h$  hours of overtime.

$$40p + 1.5ph$$

What is the employee's total pay when  $p = \$8$  and  $h = 15$ ?

- A. \$342.50
  - B. \$441.50
  - C. \$500.00
  - D. \$612.00
23. Kevin will conduct a survey at his school to determine whether students would rather purchase a salad bar lunch than buy a hot lunch or bring a sack lunch. Which question should Kevin ask in his survey?
- A. How many times a week do you purchase a hot lunch at school?
  - B. How many times a week do you bring a salad in your sack lunch?
  - C. How many times a week would you purchase a salad bar lunch if it were available?
  - D. How many times a week would you rather bring a sack lunch than buy a hot lunch at school?

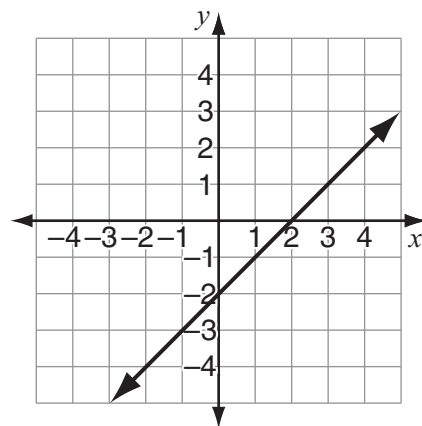
24. You may use the coordinate grid below to answer this question.



A circle with a center at  $(3, 2)$  and a radius of 3 is graphed. What are the coordinates of a point **on** the circle?

- A.  $(-1, 0)$
- B.  $(2, 0)$
- C.  $(3, -1)$
- D.  $(5, 3)$

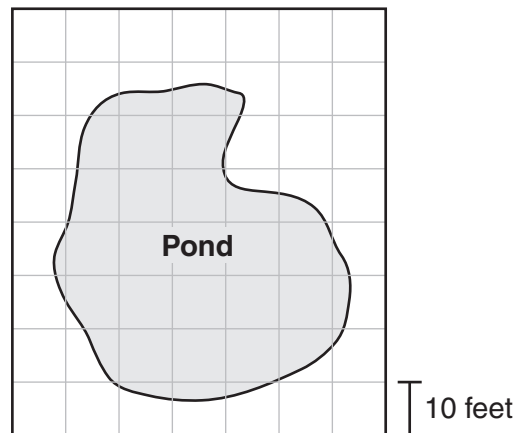
25. Study the graph below.



Which equation represents the graph?

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

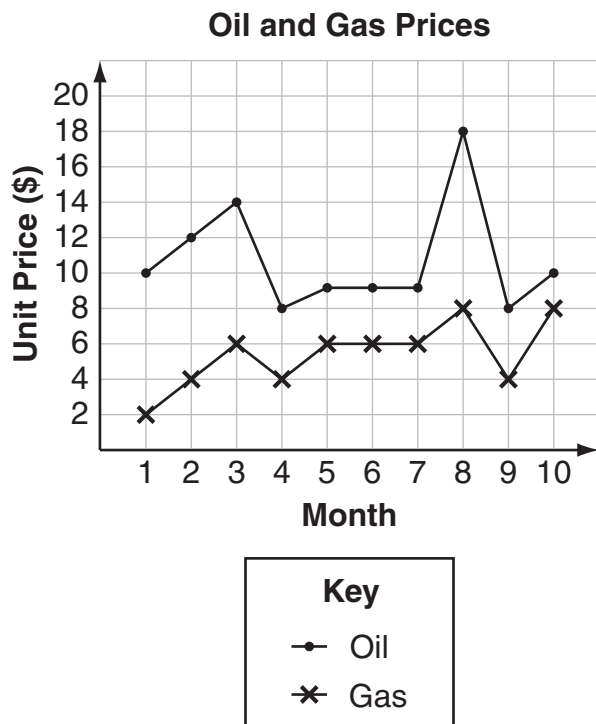
26. A map of a pond is shown below.



What is the approximate surface area, in square feet, of the pond?

- A. 5600
- B. 2500
- C. 19
- D. 15

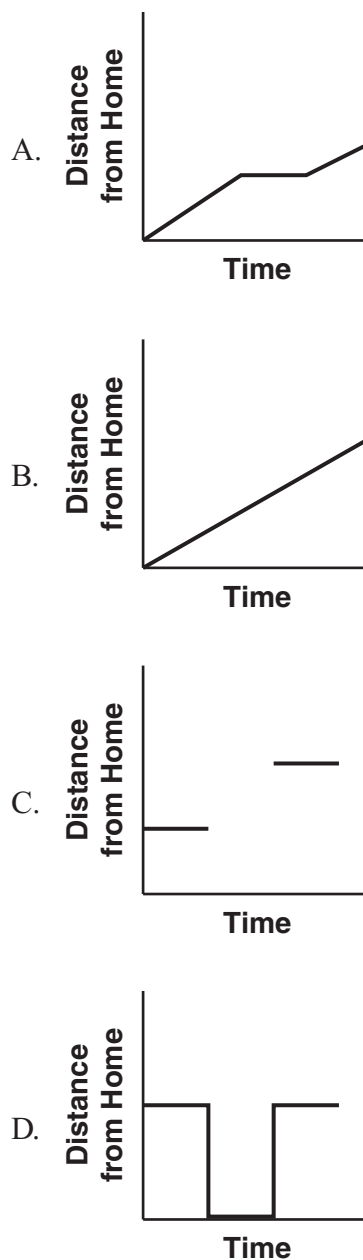
27. The graph below shows the highest prices of a unit of oil and a unit of gas each month over a 10-month period.



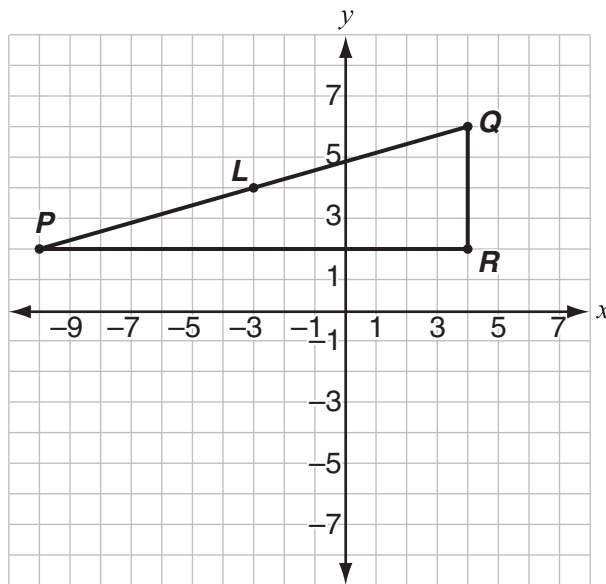
If the highest price of a unit of oil is greater than \$10 in Month 11, which is the **best** prediction about the highest price of a unit of gas during that month?

- A. The price will exceed \$8.
  - B. The price will drop below \$8.
  - C. The price will double.
  - D. The price will remain the same.
28. Just Nuts buys bulk nuts and puts them into smaller packages. How many 6-ounce packages can be made from a 12-pound bag of nuts?
- A. 2
  - B. 16
  - C. 32
  - D. 72

29. 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?



30. Triangle  $PQR$  is on the coordinate grid below.



- Copy the coordinate grid and triangle  $PQR$  onto the grid in your Answer Booklet. The midpoint of segment  $PQ$  is point  $L$ . What are the coordinates of point  $L$ ?
- On the grid, locate the midpoint of segment  $QR$  and label it point  $M$ .
- On the grid, locate the midpoint of segment  $PR$  and label it point  $S$ .
- What is the area of triangle  $LMS$ ? Show or explain how you found your answer.

### Scoring Guide

Score	Description
4	5 points
3	4 points
2	2 or 3 points; 2 only if there is a point in part d
1	1 or 2 points
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept that is being measured.
Blank	No response.