## Montana

Comprehensive Assessment System (MontCAS CRT)

Grade 8
Common Released Items
Spring 2010


Montana
Office of Public Instruction
Denise Juneau, State Superintendent

## Mathematics (No Calculator)

1. At 6:00 A.м. the temperature, in degrees Fahrenheit, was 6 degrees below zero. By noon the temperature had risen 21 degrees. A cold front came through in the afternoon and caused the temperature to drop 16 degrees by 7:00 P.m. What was the temperature at 7:00 Р.м.?
A. $-31^{\circ} \mathrm{F}$
B. $-1^{\circ} \mathrm{F}$
C. $11^{\circ} \mathrm{F}$
D. $43^{\circ} \mathrm{F}$
2. Study the expression below.

$$
2^{6}-2^{3}
$$

What is the value of this expression?
A. 6
B. 8
C. 56
D. 58
3. The product of $2 \frac{1}{3}$ and what number is 1 ?
A. $\frac{3}{7}$
B. $\frac{2}{3}$
C. $\frac{3}{2}$
D. $\frac{7}{3}$
4. The table below shows a pattern.

| $x$ | $y$ |
| :---: | ---: |
| 0 | -2 |
| 1 | 1 |
| 2 | 4 |
| 3 | 7 |

What is the rule for this pattern?
A. $y=3 x-2$
B. $y=2 x+1$
C. $y=2 x-2$
D. $y=x+2$
5. Which expression represents the prime factorization of a number?
A. $2 \times 21 \times 37$
B. $2 \times 31 \times 43$
C. $5 \times 11 \times 51$
D. $7 \times 23 \times 87$
6. Tom has a balance of $\$ 17,836$ left to pay on his truck. If he continues to make monthly payments of $\$ 592$, about how long will it take Tom to pay off his truck?
A. 3 months
B. 4 months
C. 30 months
D. 40 months
7. You may use the coordinate grid below to answer this question.


The graph of a line passes through the points $(0,3)$ and $(1,5)$. Which equation could represent the graph of the line?
A. $y=3 x+2$
B. $y=2 x+3$
C. $y=3 x+\frac{1}{2}$
D. $y=\frac{1}{2} x+3$
8. The average mass of a dust particle is $7.5 \times 10^{-7}$ grams. What is the mass in standard form?
A. $\quad 0.00000075 \mathrm{~g}$
B. $\quad 0.000000075 \mathrm{~g}$
C. $\quad 7.00000005 \mathrm{~g}$
D. 750000000 g
9. Let $p$ and $q$ be two numbers such that:

$$
0<p<q<1
$$

Which statement about $p$ and $q$ must always be true?
A. $p+q<1$
B. $p+q>1$
C. $p q>1$
D. $p q<1$
10. Compute:

40 is $20 \%$ of what number?
11. What is the value of the expression below when $p=100, v=7, r=8$, and $t=5$ ?

$$
p v-r t^{2}
$$

## Mathematics (Calculator)

12. When Mrs. Stewart makes pie dough, she uses $\frac{2}{3}$ cup of shortening for every $2 \frac{1}{2}$ cups of flour. Which proportion could be used to find the amount of flour, $x$, Mrs. Stewart needs when she uses 5 cups of shortening?
A. $\frac{\frac{2}{3}}{2 \frac{1}{2}}=\frac{x}{5}$
B. $\frac{\frac{2}{3}}{x}=\frac{2 \frac{1}{2}}{5}$
C. $\frac{\frac{2}{3}}{5}=\frac{x}{2 \frac{1}{2}}$
D. $\frac{\frac{2}{3}}{2 \frac{1}{2}}=\frac{5}{x}$
13. Mr. Herman recorded the number of points earned by each student on a recent test. The box-and-whisker plot below represents these data.


Approximately what percent of the students earned 50 points or less?
A. $20 \%$
B. $25 \%$
C. $75 \%$
D. $80 \%$
14. Rectangle $M S P L$ is plotted on the coordinate grid below.


What is the length of a diagonal of this rectangle?
A. 12 units
B. 13 units
C. 17 units
D. 34 units
15. The diagram below shows the position of a ship relative to a port and a nearby lighthouse.


Which equation could be used to calculate $x$, the distance the ship is from the port?
A. $x+0.5=2.5$
B. $x=2(0.5)+2(2.5)$
C. $x^{2}+(0.5)^{2}=(2.5)^{2}$
D. $x^{2}=(0.5)^{2}+(2.5)^{2}$
16. Which net, when folded along the dotted lines, will form a prism?
A.

B.

C.

D.

17. Use the expression below to answer the question.

$$
9(w+1)
$$

If $w$ is a whole number, which statement is always true?
A. The expression is divisible by 2 .
B. The expression is divisible by 3 .
C. The expression is divisible by 5 .
D. The expression is divisible by 6 .
18. A cone-shaped tank and a cylindrical tank have the same height and radius as shown in the figure below.


The cylindrical tank holds how many times as much water as the cone-shaped tank?
A. $1 \frac{1}{3}$ times as much water
B. 2 times as much water
C. $2 \frac{2}{3}$ times as much water
D. 3 times as much water
19. The line plot below shows the number of runs a baseball team scored during each of ten games this season.

Runs Scored at Games


Which number is closest to the team's mean number of runs per game?
A. 3
B. 7
C. 8
D. 11
20. Simplify:

$$
x+3(x+4)+2 x
$$

A. $4 x+4$
B. $6 x+4$
C. $6 x+12$
D. $10 x$

Use the graph below to answer question 21.

21. What is the slope of the line?
A. $-\frac{3}{2}$
B. $-\frac{2}{3}$
C. $\frac{2}{3}$
D. $\frac{3}{2}$
22. Mary is knitting a baby blanket. She must knit 90 rows to complete the project. She can knit 2.5 rows each hour. Which equation represents the number of rows, $r$, Mary has left to do after $h$ hours of knitting?
A. $r=90-2.5 h$
B. $r=90-h$
C. $r=90 h-2.5$
D. $r=92.5-h$
23. At a school dance, it is predicted that 80 students will each buy one 12-ounce glass of punch. Based on this prediction, how many gallons of punch should be purchased for the dance?
A. 6.7 gallons
B. $\quad 7.5$ gallons
C. 20 gallons
D. 30 gallons
24. The county fair has an exhibit of farm animals. The chart below shows the number of animals in the exhibit.

## Animals in the Exhibit

| Animal | Number in the Exhibit |
| :--- | :---: |
| Sheep | 25 |
| Cow | 40 |
| Horse | 15 |
| Goat | 70 |

Sandy is making a graph to show the distribution of animals in the exhibit. Which type of graph is the most appropriate to use to display these data?
A. circle
B. line
C. stem and leaf
D. histogram
25. Mr. Fox has a gift bag with 5 red pencils, 6 blue pencils, and 3 green pencils. What is the probability that a randomly selected pencil is a color other than red?
A. $\frac{5}{14}$
B. $\frac{5}{9}$
C. $\frac{9}{14}$
D. $\frac{9}{5}$
26. A box containing butter has the shape of a rectangular prism, as shown in the diagram below.


What is the volume of the box?
A. 10 cubic inches
B. 20 cubic inches
C. 31.25 cubic inches
D. 62.5 cubic inches
27. Sarah spins the arrows on the two spinners shown below at the same time.


What is the probability that the arrows land on a 2 and an R ?
A. $\frac{1}{9}$
B. $\frac{1}{8}$
C. $\frac{1}{3}$
D. $\frac{8}{9}$
28. A spinner has sections that are red, blue, yellow, green, and brown. There are no other colors on the spinner. Michael spun the arrow on the spinner 100 times. The table below shows the number of times the arrow landed on each color.

| Color | Number of Times <br> Arrow Landed on Color |
| :--- | :---: |
| Red | 24 |
| Blue | 17 |
| Yellow | 30 |
| Green | 23 |
| Brown | 6 |

Michael spins the arrow on the spinner one more time. Based on the data in the table, what is the probability that the arrow will land on red?
A. $\frac{1}{76}$
B. $\frac{6}{25}$
C. $\frac{6}{19}$
D. $\frac{19}{25}$
29. A parallelogram and its image are shown on the coordinate grid below.


Parallelogram $A^{\prime} F^{\prime} K^{\prime} M^{\prime}$ is the image of parallelogram $A F K M$ after a transformation.
a. What are the coordinates of point $A$ ?
b. Describe a single transformation that resulted in the image $A^{\prime} F^{\prime} K^{\prime} M^{\prime}$.
c. Copy the coordinate grid and parallelogram $A F K M$ into your Answer Booklet. On this coordinate grid, reflect $A F K M$ across the $y$-axis. Label the image $L Q N P$.

## Scoring Guide

| Score | Description |
| :---: | :--- |
| $\mathbf{4}$ | 4 points |
| $\mathbf{3}$ | $3-3 \frac{1}{2}$ points |
| $\mathbf{2}$ | $2-2 \frac{1}{2}$ points |
| $\mathbf{1}$ | $\frac{1}{2}-1 \frac{1}{2}$ points <br> OR <br> Student shows minimal understanding of graphing and performing transformations on a <br> coordinate graph. |
| $\mathbf{0}$ | Response is incorrect or contains some correct work that is irrelevant to the skill or concept that is <br> being measured. |
| Blank | No response. |

