

Grade 8
Released Items With Data

2011

## 100000008478

00 Which of the following numbers is equivalent to the expression shown below?

$$
-(-12)(-10)-(-132)
$$

(A) -134
(B) -110
© 12
(0) 254

00 Point $G$ and line $s$ are shown on the coordinate grid.


If point $G$ is reflected across line $s$, what are the coordinates of point $\boldsymbol{G}^{\prime}$ ?
(A) $(-7,2)$
(B) $(-6,-1)$
© $(-6,1)$
(D) $(-5,0)$

Kaitlin is going to wrap her brother's birthday present in a box that is shaped like a right rectangular prism. The box is 7.5 inches long, 3 inches wide, and 5 inches high. What is the smallest amount of wrapping paper in square inches that Kaitlin will need to cover the box?
(A) $30 \mathrm{sq} \mathrm{in}$.
(B) $45 \mathrm{sq} \mathrm{in}$.
(C) 75 sq in .
(D) $150 \mathrm{sq} \mathrm{in}$.

## 100000273055

00 Justin can use the following expression to find the value of $\boldsymbol{y}$.

## Three times $\boldsymbol{x}$ less twelve

Which table shows ordered pairs that could have used this expression to determine the values of $\boldsymbol{y}$ ?
(A)

| $x$ | $y$ |
| :---: | :---: |
| 1 | 9 |
| 2 | 6 |
| 4 | 0 |

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| $x$ | $\boldsymbol{y}$ |
| :---: | :---: |
| 1 | 33 |
| 2 | 30 |
| 4 | 24 |

(B)

| $x$ | $y$ |
| :---: | :---: |
| 1 | -9 |
| 2 | -6 |
| 4 | 0 |

(D)

| $x$ | $\boldsymbol{y}$ |
| :---: | :---: |
| 1 | -33 |
| 2 | -30 |
| 4 | -24 |

00 The Blake family spends $\$ 4,000$ each month on expenses. The portion of monthly expenses spent in each category is shown in the circle graph.


Based upon information in the circle graph, estimate the amount in dollars the Blake family spends on cars. Write your answer in the space provided. Show your work or explain how you estimated your answer.

Amount Spent on Cars: $\qquad$ dollars
$\qquad$
$\qquad$
$\qquad$

Chris, Kelly, and Pat were the first three students to finish an obstacle course.

- Chris finished in 5.8 minutes.
- Kelly finished in $5 \frac{5}{8}$ minutes.
- Pat finished in $\frac{52}{9}$ minutes.

Which list shows their finish times from least to greatest?
A. $5 \frac{5}{8}, \frac{52}{9}, 5.8$
B. $5 \frac{5}{8}, 5.8, \frac{52}{9}$
C. $5.8, \frac{52}{9}, 5 \frac{5}{8}$
D. $5.8,5 \frac{5}{8}, \frac{52}{9}$

Point $\boldsymbol{A}$ lies on line GH as shown on the coordinate plane.


Which of the following best represents the coordinates of a point on a line perpendicular to line $\mathbf{G H}$ at point $\boldsymbol{A}$ ?
A. $(6,3)$
B. $(3,6)$
C. $(6,5)$
D. $(5,6)$

Jamie bought a tablecloth for her circular table. She then sewed a fringe trim along the entire edge, as shown in the picture below.

## Jamie's Tablecloth



If Jamie sewed a total of 16 feet of fringe trim along the entire edge of the tablecloth, which of these is closest to the radius in feet of the tablecloth? (Use $\pi \approx 3.14$ )
A. 1.9 ft
B. 2.5 ft
C. 5.1 ft
D. 6.4 ft

The chart below shows the winning speeds for the past 5 years at a dragster racetrack.

> Winning Speeds at a Dragster Racetrack

| Year | Speed <br> (mph) |
| :---: | :---: |
| 1 | 291 |
| 2 | 303 |
| 3 | 283 |
| 4 | 291 |
| 5 | 300 |

What is the range of the speeds listed in the chart?
A. 303
B. 291
C. 20
D. 9

Janet is planning to purchase a membership at a local health club. The health club charges each member a one-time enrollment fee of $\$ 50$ plus a monthly fee of $\$ 19$.

Part A. In the space below, write an equation that Janet could use to calculate $c$, the total charge for joining the health club and being a member for $m$ months.

## Equation:

$\qquad$

Part B. Janet has saved $\$ 225$ to purchase a membership at the health club. After paying the enrollment fee, what is the number of membership months Janet can purchase using her savings? Write your answer in the space below. Show or explain how you got your answer.

Number of Months: $\qquad$

René cut 5 pieces of fabric of the same length from a roll of fabric to make curtains.

- Each piece of fabric was $8 \frac{1}{4}$ feet in length.
- The roll of fabric was 45 feet in length.

What is the amount of fabric remaining on the roll?
A. $3 \frac{1}{5} \mathrm{ft}$
B. $3 \frac{3}{4} \mathrm{ft}$
C. $4 \frac{1}{5} \mathrm{ft}$
D. $4 \frac{3}{4} \mathrm{ft}$

An agricultural lab uses the following equation to predict $\boldsymbol{h}$, the height of a plant in inches after w weeks of experimental growth.

$$
h=8 w
$$

What will be the height of the plant in inches after 5 weeks of experimental growth?
A. 40 in .
B. 13 in.
C. $\frac{8}{5}$ in.
D. $\frac{5}{8}$ in.

Jason drew an angle that measured $65^{\circ}$. What would be the measure of its complementary angle?
A. $115^{\circ}$
B. $105^{\circ}$
C. $35^{\circ}$
D. $25^{\circ}$

Theo spun the arrow of a spinner 20 times during a math game. The spinner is divided into 4 sections of equal size, each labeled blue, green, red or yellow. The table shows the number of times the arrow landed on each section.

Theo's Spinner Data

| Section | Number |
| :--- | :---: |
| Blue | 6 |
| Green | 2 |
| Red | 3 |
| Yellow | 9 |

Based on theoretical probability, which statement best describes the outcomes of the arrow landing on a yellow section?
A. It landed 4 more times than expected.
B. It landed 5 more times than expected.
C. It landed 4 less times than expected.
D. It landed 5 less times than expected.

The grid below shows triangle $A^{\prime} B^{\prime} C^{\prime}$, the translated image of triangle $A B C$.


Part A. Triangle $A B C$ was in the fourth quadrant before it was translated to form triangle $A^{\prime} B^{\prime} C^{\prime}$. Point $B$ was located at ( $4,-2$ ). What were the coordinates of the other two vertices of triangle ABC before the translation? Write your answers in the spaces below. You may use the coordinate grid to show or explain how you got your answer.

Coordinates of $A$ : $\qquad$

Coordinates of $\mathbf{C}$ : $\qquad$
$\qquad$
$\qquad$

Part B. Using your coordinates from Part A, describe the translation that could have been used on triangle ABC to obtain triangle $A^{\prime} B^{\prime} C^{\prime}$. Write your answer in the space provided. Show or explain how you got your answer.

Translation: $\qquad$

## 8N2

Number Operations and Concepts - Understand ways to represent numbers, relationships among numbers, and number systems

One winter morning the temperature at 7 a.m. was $-2^{\circ} \mathrm{F}$. At noon on the same day, the temperature was $6^{\circ} \mathrm{F}$.

Part A. On the number line below, label the number line and mark the location of point $P$ at -2 and point $Q$ at 6 .


Part B. What is the number of degrees the temperature had risen between 7 a.m. and noon? Write your answer in the space below. Show or explain how you got your answer. You may use the number line to show your work.

Number of Degrees: $\qquad$

## 8N3

Number Operations and Concepts - Develop the connection between conceptual understanding and computational proficiency

Jordan went to the grocery store and placed 10 items into his basket.

- Three of the items ranged in price from $\mathbf{\$ 0 . 5 0}$ to $\mathbf{\$ 1 . 0 0}$, including tax.
- The rest of the items ranged in price from $\mathbf{\$ 3 . 5 0}$ to $\mathbf{\$ 5 . 7 5}$, including tax.

Jordan has $\mathbf{\$ 3 0 . 0 0}$ and believes he has enough money to pay for the $\mathbf{1 0}$ items. In the space below, use estimation to show or explain why Jordan most likely does not have enough money to pay for the 10 items.

Explanation: $\qquad$

In his math class, Rodrigo simplified an algebraic expression, as shown below.

| Expression | $2+6(5+4) \div 3$ |
| ---: | :--- |
| Step 1 | $8(5+4) \div 3$ |
| Step 2 | $8(9) \div 3$ |
| Step 3 | $72 \div 3$ |
| Step 4 | 24 |

Part A. In the space below, explain the error Rodrigo made when he simplified the expression.

Explanation: $\qquad$
$\qquad$
$\qquad$
$\qquad$

Part B. What is the correct value of the expression? In the space below, show each of the steps you used to get your answer.

Correct Value of Expression: $\qquad$

## 8G1

Geometry - Specify locations and describe spatial relationships using coordinate geometry and other representational systems

Jerry is training his pigeons to fly home from distant places. Starting from his house, Jerry drives 13 miles east and then 6 miles north where he lets the pigeons go. If the pigeons fly directly home, which of these is closest to the number of miles they will fly?
A. 8.8 mi

B . 14.3 mi
C. 19 mi

D . 205 mi

Theodore placed square tiles on his kitchen wall in a horizontal manner, as shown in the design below.


Which of the following does not describe a part of the design?
A. Parallel line segments

B . Perpendicular line segments
C. Right angles
D. Obtuse angles

## 8G3

Geometry - Apply transformations and use symmetry to analyze mathematical situations

In the drawing below, $A B C D$ is an isosceles trapezoid.


If MNPQ is similar to $A B C D$, which of the following statements is true?

A $\angle C$ is congruent to $\angle Q$.
$B$ The length of segment $B C$ is $\mathbf{1 2} \mathbf{i n}$.

C The measure of $\angle N$ is twice the measure of $\angle B$.

D
Segment $A B$ is $\frac{\mathbf{1}}{\mathbf{2}}$ the length of segment $P Q$.

## 8M2

Measurement - Apply appropriate techniques, tools, and formulas to determine perimeter, area or volume

In math class Rachel was asked to build a rectangular prism using 18 wooden cubes. The edges of each cube are 1 inch in length.

Part A. Rachel used all 18 cubes to build the prism. In the space below, draw a picture of what Rachel's prism could look like, and write the dimensions of the prism.

Part B. What is the surface area of the rectangular prism you drew in Part A? Write your answer in the space below. Show or explain how you got your answer.

Surface Area in Square Inches: $\qquad$

## 8A1

Algebra - Understand patterns, relations, and functions
What value of $\boldsymbol{d}$ will make the following equation true?

$$
d-12=36
$$

A - 3
B 14
C 24
D 48

A home-improvement center rents power washers to customers for a onetime charge of $\mathbf{\$ 1 5}$ plus an hourly rate of $\$ 5$. The equation below can be used to find $r$, the total charge to rent a power washer for $h$ hours.

$$
r=15+5 h
$$

What is the total charge to rent a power washer for 4 hours?
A $\mathbf{\$ 2 0}$
B \$24
C $\$ 35$
D $\mathbf{\$ 8 0}$

## 8A2

## Algebra - Use mathematical models to represent and understand quantitative relationships

A fathom is a unit used to measure nautical depth. One fathom is equivalent to 1.8 meters. Which of these expressions can be used to determine the number of fathoms in $m$ meters? 2
A. $m-1.8$
B. $m+1.8$
C. 1.8 m
D. $m$
$\overline{1.8}$

## 8D1

Data Analysis and Probability - Collect, organize, and display relevant data to answer questions and use appropriate statistical methods to analyze the data
, The heights of the $\mathbf{1 0}$ players on a high school basketball team are shown below.

Heights of Players

| 63 in. | 72 in. |
| :--- | :--- |
| 72 in. | 69 in. |
| 70 in. | 70 in. |
| 65 in. | 72 in. |
| 76 in. | 73 in. |

What is the median height of the players on the team?
A. 68 in .
B. 70 in .
C. 71 in .
D. 72 in .


The graph compares the median household income of five Wyoming counties for 1979 and 1989.

Which of the following statements about the information on the graph appears to be true?

A Campbell County had the greatest household income during both 1979 and 1989.

B Natrona County had the least range in household income between 1979 and 1989.

C For all five counties, the mean household income in 1989 was greater than the mean household income in 1979.

D For all five counties, the range in the household income during 1989 was less than the range of the household income in 1979.

