

# **Maine Through Year Assessment**

## **Item Type Sampler**

### **Math**

### **Grade 6**

Student's Name:

**Directions:**

On the following pages of your booklet are questions for the Grade 6 *Maine Through Year Assessment Mathematics* Item Type Sampler.

Read these directions carefully before beginning this item type sampler.

This item type sampler will include several different types of questions. Multiple choice questions will ask you to select an answer from among four choices. Multiple select questions will ask you to select multiple correct answers from among five or more choices. For some questions, there may be two parts, Part A and Part B, where each part has a multiple choice or multiple select question. These questions will be found in your item type sampler.

For all questions:

- Read each question carefully and choose the best answer.
- You may use scratch paper to solve the problems.
- The Mathematics Reference Sheet is provided in the back of the Mathematics section. You may refer to this page at any time during the sampler.
- You may use a calculator ONLY for questions 1–3. You may NOT use a calculator for any other questions on this sampler.
- Be sure to answer ALL the questions.

When you come to the word STOP at the end of Part 1, you have finished Part 1 of the Grade 6 Mathematics Item Type Sampler. You may review ONLY Part 1 to check your answers. Your calculator must be collected before you can continue with Part 2. When your calculator has been collected, and your proctor has given you permission, you may move on to Part 2.

When you are finished with Part 2, you may review ONLY Part 2 to check your answers.

## Perimeter

The perimeter of a polygon is equal to the sum of the lengths of its sides.

## Circumference of a Circle

$$C = \pi d \quad \text{or} \quad C = 2\pi r$$

$$\pi \approx 3.14$$

## Area

Triangle  $A = \frac{1}{2}bh$

Rectangle  $A = bh \quad \text{or} \quad A = lw$

Circle  $A = \pi r^2$

## Surface Area

The total area of the 2-dimensional surfaces that make up a 3-dimensional object.

## Volume

Right Rectangular Prism  $V = lwh \quad \text{or} \quad V = Bh$

Right Prism  $V = Bh$

Cylinder  $V = \pi r^2 h$

Cone  $V = \frac{1}{3}\pi r^2 h$

Sphere  $V = \frac{4}{3}\pi r^3$

Pyramid  $V = \frac{1}{3}Bh$

## Slope Formula

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

## Linear Equation

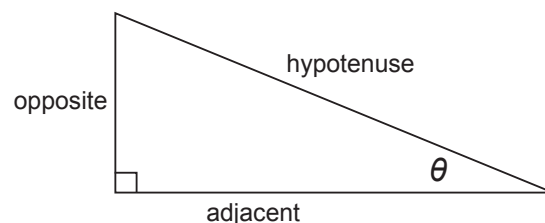
$$y = mx + b$$

## Pythagorean Theorem

$$a^2 + b^2 = c^2$$

## Definition of Trigonometric Functions

For  $0^\circ < \theta < 90^\circ$ ,



$$\sin \theta = \frac{\text{opposite}}{\text{hypotenuse}}$$

$$\cos \theta = \frac{\text{adjacent}}{\text{hypotenuse}}$$

$$\tan \theta = \frac{\text{opposite}}{\text{adjacent}}$$

## Mean

$$\bar{x} = \frac{x_1 + x_2 + x_3 + \dots + x_n}{n}$$

## Interquartile Range

$$IQR = Q_3 - Q_1$$

The difference between the third quartile and first quartile of a set of data.

## Standard Deviation

$$\sigma = \sqrt{\frac{(x_1 - \bar{x})^2 + (x_2 - \bar{x})^2 + \dots + (x_n - \bar{x})^2}{n}}$$

1. A storage container in the shape of a right rectangular prism is 2 feet tall and 1.5 feet wide. The container has a volume of 5.25 cubic feet. To the nearest hundredth, what is the length of the container?

- A. 1.50 feet
- B. 1.75 feet
- C. 3.94 feet
- D. 7.00 feet

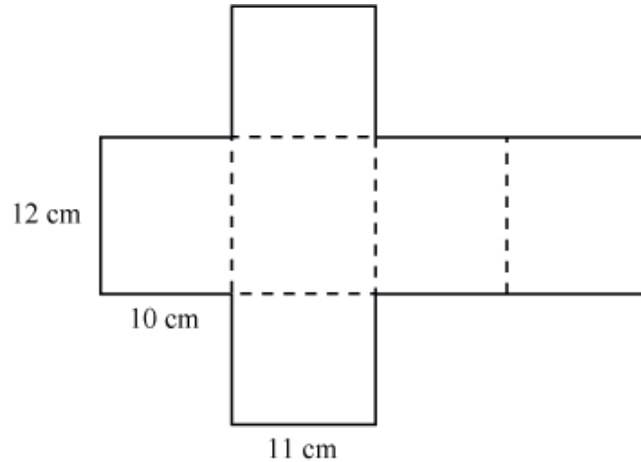
2. Use the set of data to answer the question.

83, 90, 53, 74, 77, 99, 54, 64

What is the range of the data?

- A. 19
- B. 20
- C. 46
- D. 50

3. Use the net to answer the questions.



**Part A**

What are the different areas of the faces of the figure formed by the net? Select **all** that apply.

- A. 100 square centimeters
- B. 110 square centimeters
- C. 120 square centimeters
- D. 121 square centimeters
- E. 132 square centimeters
- F. 144 square centimeters

**Part B**

What is the surface area of the figure formed by the net?

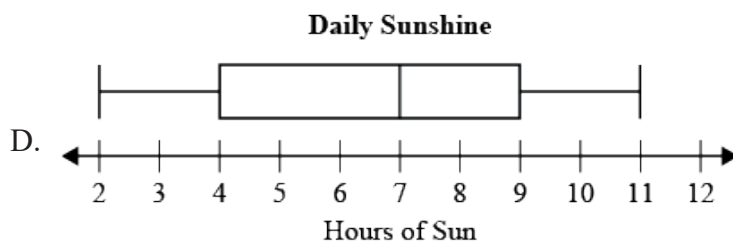
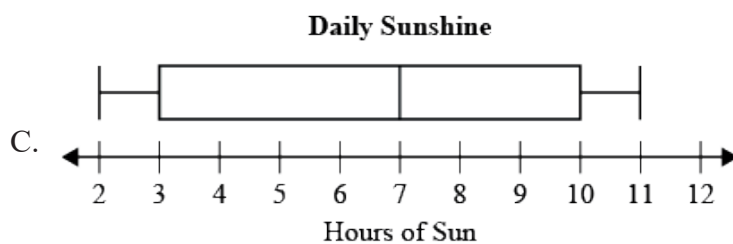
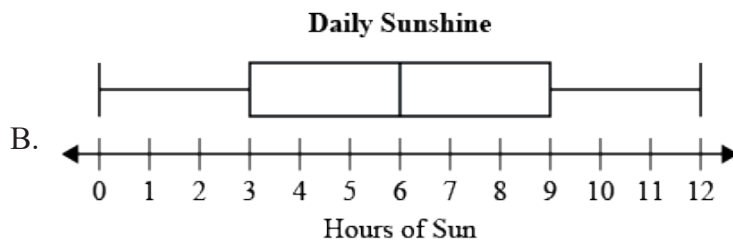
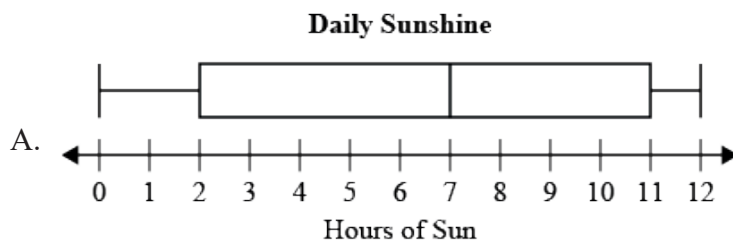
- A. 362 square centimeters
- B. 720 square centimeters
- C. 724 square centimeters
- D. 1,320 square centimeters

4. A standard car has 4 tires and 2 side-view mirrors. Which description has the same ratio of tires to side-view mirrors?
  - A. 8 tires and 4 side-view mirrors
  - B. 6 tires and 4 side-view mirrors
  - C. 4 tires and 4 side-view mirrors
  - D. 2 tires and 4 side-view mirrors
  
5. Which choices show two equivalent expressions? Select **all** that apply.
  - A.  $x + x + x$  and  $3 + x$
  - B.  $2x + 2x + x$  and  $4x$
  - C.  $4x + 2$  and  $6x$
  - D.  $5x - x$  and  $8x - 4x$
  - E.  $6x + 4$  and  $4x + 1 + 2x + 3$

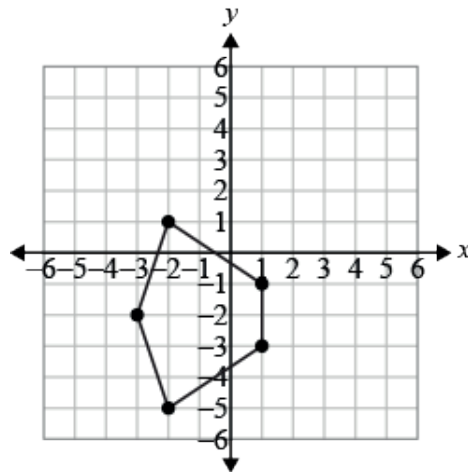
6. A weather forecaster records the amount of sunshine on 10 different days. The list shows the number of hours of sunshine on each day.

7, 12, 2, 4, 9, 11, 12, 0, 0, 7

Which box plot correctly represents the data?



7. Use the graph to answer the question.



What is the name of the polygon shown on the graph?

- A. hexagon
  - B. octagon
  - C. pentagon
  - D. quadrilateral
8. A coach buys packages of baseballs and sets of baseball bats.
- Each package of baseballs contains 8 baseballs.
  - Each set of baseball bats contains 6 baseball bats.

The coach buys the least number of packages of baseballs and sets of baseball bats to get the same number of baseballs and bats.

How many baseballs does the coach buy?

- A. 14
- B. 24
- C. 28
- D. 48

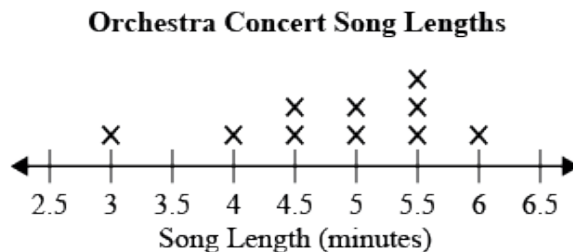


9. A family took a vacation last summer and traveled a total of  $x$  miles in their car. Their gas mileage average was 25 miles per gallon, and they used a total of 140 gallons of gasoline on their trip.

Which equation can be used to solve for  $x$ ?

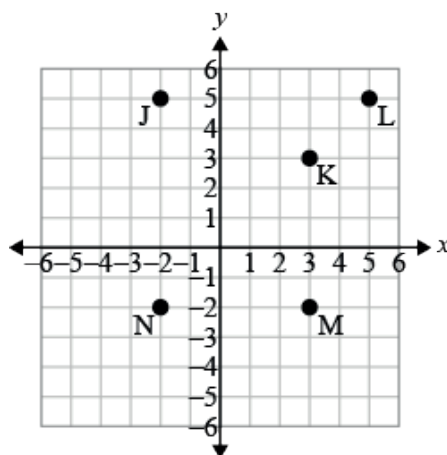
- A.  $\frac{x}{25} = 140$
- B.  $25x = 140$
- C.  $\frac{25}{x} = 140$
- D.  $\frac{140}{x} = 25$
10. The cost for a dish of ice cream with candy toppings can be represented by the equation  $y = 1.25x + 2.30$ . The variable  $x$  represents the number of toppings ordered, and the variable  $y$  represents the total cost of ice cream with toppings, in dollars.
- Which statement explains the meaning of the quantities in this situation?
- A. The cost of ice cream with no toppings is \$1.25 plus \$2.30 for each topping.
- B. The cost of ice cream with no toppings is \$2.30 plus \$1.25 for each topping.
- C. The cost of the first topping is \$2.30, and each additional topping costs \$1.25.
- D. The total cost of toppings is \$1.25, and the total cost for the ice cream and toppings is \$2.30.

11. The line plot shows the length of each song played at an orchestra concert, to the nearest half minute.



Which statement about the data is true?

- A. The mode is less than 4.
  - B. The median is less than 3.
  - C. The mean is greater than 4.
  - D. The median is greater than 5.
12. Point Z has the coordinates  $(-2, 3)$ .



Which points on the graph are a distance of 5 units from point Z? Select **all** that apply.

- A. point J
- B. point K
- C. point L
- D. point M
- E. point N

13. What is the value of  $123.25 \div 17$ ?

- A. 6.125
- B. 7.25
- C. 20.95
- D. 72.5

14. What is the value of  $5 \div \frac{9}{10}$ ?

- A.  $\frac{9}{50}$
- B.  $\frac{2}{9}$
- C.  $\frac{9}{2}$
- D.  $\frac{50}{9}$

15. A parallelogram graphed on a coordinate plane has vertices at the points  $(-2, 3)$ ,  $(1, 3)$ , and  $(-3, -1)$ . Which point could be added to the graph to complete the parallelogram?

- A.  $(-3, -4)$
- B.  $(-3, 2)$
- C.  $(0, -1)$
- D.  $(1, -1)$

# Maine Through Year Assessment Grade 6

## Paper Item Type Sampler Answer Key

### Mathematics

---

Sequence	Key	Points
1.	B	1
2.	C	1
3.	Part A: B, C, E Part B: C	2
	Part A or Part B	1
4.	A	1
5.	D, E	1
6.	A	1
7.	C	1
8.	B	1
9.	A	1
10.	B	1
11.	C	1
12.	B, E	1
13.	B	1
14.	D	1
15.	C	1