Mathematics

SESSION 1

You may use your reference sheet and MCAS ruler during this session.
*You may **not** use a calculator during this session.*

DIRECTIONS
This session contains nine multiple-choice questions, two short-answer questions, and one open-response question. Mark your answers to these questions in the spaces provided in your Student Answer Booklet.

1 Simon's car travels about 28 miles per gallon of gas. Which of the following is closest to the number of gallons of gas Simon's car will need to travel 578 miles?

A. 10

B. 20

C. 30

D. 40

2 The table below shows a linear relationship between *x* and *y*.

| *x*	*y*
1	5
2	8
3	11
4	14

As the value of *x* increases by 1, what happens to the value of *y*?

A. The value of *y* increases by 3.

B. The value of *y* increases by 4.

C. The value of *y* increases by 5.

D. The value of *y* increases by 6.

3 Samantha drew a square and a parallelogram.

- The square has a side length of 8 centimeters.

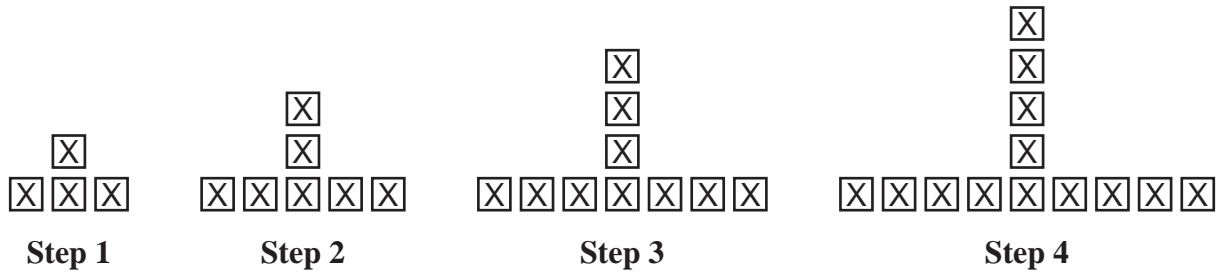- The perimeter of the square is the same as the perimeter of the parallelogram.

The parallelogram and one of its dimensions are shown below.
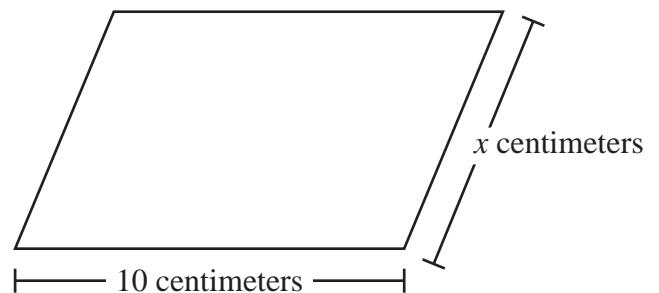
What is the value of *x*?

A. 22

B. 12

C. 11

D. 6

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4 Caleb made an arithmetic pattern using cards with the letter X on them. The first four steps of his pattern are shown below.

Step 1   **Step 2**   **Step 3**   **Step 4**

Caleb continued his pattern. What is the total number of cards in Step 8?
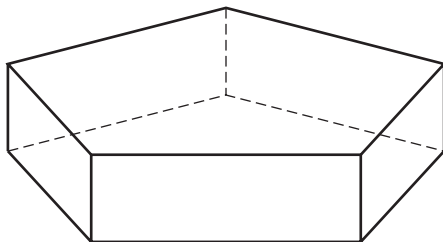
A. 21

B. 24

C. 25

D. 32

Question 5 is a short-answer question. Write your answer to this question in the box provided in your Student Answer Booklet. Do not write your answer in this test booklet. You may do your figuring in the test booklet.

5   What is the value of the expression below when $m = 4$ and $n = 2$?

$$-m(n + m)$$

Mark your answers to multiple-choice questions 6 and 7 in the spaces provided in your Student Answer Booklet. Do not write your answers in this test booklet. You may do your figuring in the test booklet.

6   A pentagonal prism is shown below.

What is the total number of edges of a pentagonal prism?

A.   7

B.   10

C.   12

D.   15

7   Which of the following is equivalent to the expression below?

$$\frac{1}{5} \cdot 62$$

A. $62 \div 5$

B. $62 \div \frac{1}{5}$

C. $5 \div 62$

D. $\frac{1}{5} \div 62$

Question 8 is a short-answer question. Write your answer to this question in the box provided in your Student Answer Booklet. Do not write your answer in this test booklet. You may do your figuring in the test booklet.

8 Alice made 48 cupcakes.

- She frosted $\frac{1}{2}$ of the cupcakes.
- She put sprinkles on $\frac{1}{3}$ of the frosted cupcakes.
- She ate $\frac{1}{4}$ of the frosted cupcakes that had sprinkles.

What is the total number of cupcakes that Alice ate?

Question 9 is an open-response question.

- **BE SURE TO ANSWER AND LABEL ALL PARTS OF THE QUESTION.**
- **Show all your work (diagrams, tables, or computations) in your Student Answer Booklet.**
- **If you do the work in your head, explain in writing how you did the work.**

Write your answer to question 9 in the space provided in your Student Answer Booklet.

9   Vic is moving, and he needs to hire a moving company. The rates for Manny's Movers and Jiffy Move are shown below.

Manny's Movers	**Jiffy Move**
Labor Rate $100 per hour	**Labor Rate** $125 per hour
Mileage Rate $0.75 per mile	**Mileage Rate** $0.30 per mile
	★★★★★★★★★★★★★★★★★★★★★★★★ **10% Discount Off the Total** **for Moves on Wednesdays**

Vic is moving a distance of 200 miles. It will take the movers a total of 8 hours of labor.

a. What amount, in dollars, would Manny's Movers charge Vic for mileage? Show or explain how you got your answer.

b. What amount, in dollars, would Manny's Movers charge Vic for both labor and mileage? Show or explain how you got your answer.

c. Vic decides to move on a Wednesday. Which moving company would charge him the least amount for his move? Show or explain how you got your answer.

Mathematics Session 1

Mark your answers to multiple-choice questions 10 through 12 in the spaces provided in your Student Answer Booklet. Do not write your answers in this test booklet. You may do your figuring in the test booklet.

10 Karin used a single transformation of trapezoid P to create the image Q on the coordinate plane shown below.
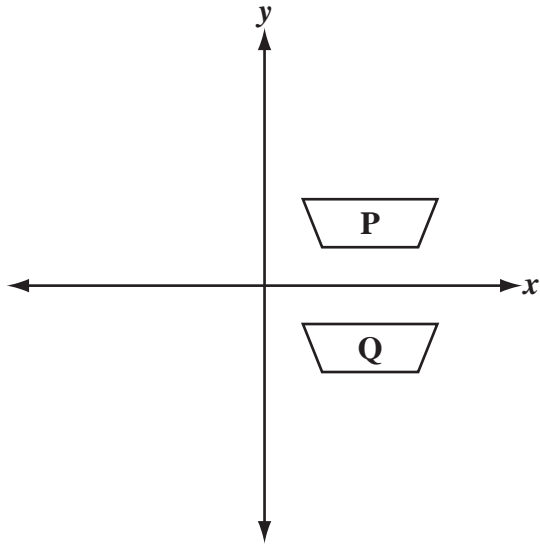
Which of the following could describe the transformation that Karin used?

A. reflection over the *x*-axis

B. reflection over the *y*-axis

C. translation down

D. translation up

11 An input-output table is below.

Input	Output
-2	-6
-4	-8
-8	-12
-16	-20

Which rule shows the relationship between the input number and the output number?

A. add 4

B. add -4

C. multiply by 3

D. multiply by -3

12 What is the value of the expression below when $y = -1$ and $x = -4$?

$$3y - 2x$$

A. -11

B. -5

C. 5

D. 11

Mathematics

SESSION 2

You may use your reference sheet and MCAS ruler during this session.
*You may use a calculator during this session.*

DIRECTIONS
This session contains seven multiple-choice questions, one short-answer question, and one open-response question. Mark your answers to these questions in the spaces provided in your Student Answer Booklet.

13 The Venn diagram below shows the number of seventh-grade students who are in the choir, in the band, in both the choir and the band, or in neither.

Seventh-Grade Students

Neither
14
Choir: 41
8
Band: 32
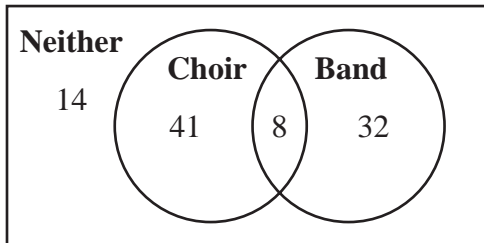
What is the total number of seventh-grade students who are **not** in the band?
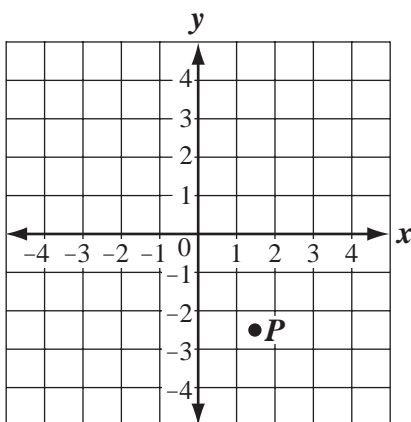
A. 41
B. 55
C. 63
D. 95

14 Tomás practiced the piano 3 hours less than twice as many hours as David practiced.

Let d represent the number of hours that David practiced. Which of the following expressions represents the number of hours that Tomás practiced?

A. $3d - 2$
B. $3 - 2d$
C. $2d - 3$
D. $2 - 3d$

15 The location of point P is shown on the grid below.

Which of the following pairs of coordinates best represents the location of point P?

A. $(2, -3)$

B. $(3, -2)$

C. $\left(1\frac{1}{2},\ -2\frac{1}{2}\right)$

D. $\left(2\frac{1}{2},\ -1\frac{1}{2}\right)$

Question 16 is a short-answer question. Write your answer to this question in the box provided in your Student Answer Booklet. Do not write your answer in this test booklet. You may do your figuring in the test booklet.

16   A bunch of bananas weighs 40 ounces. What is the weight in pounds of the bunch of bananas? (1 pound = 16 ounces)

Mark your answers to multiple-choice questions 17 through 19 in the spaces provided in your Student Answer Booklet. Do not write your answers in this test booklet. You may do your figuring in the test booklet.

17 On which of the following graphs does the line have a positive rate of change?

A.

C.

B.

D.
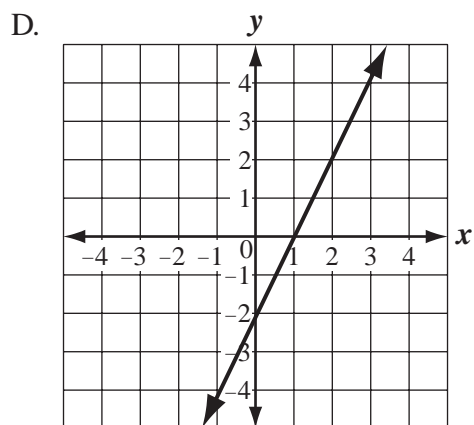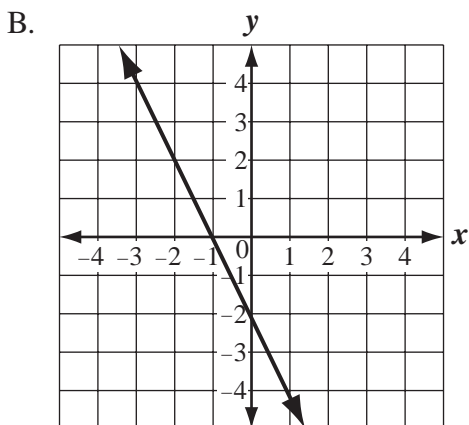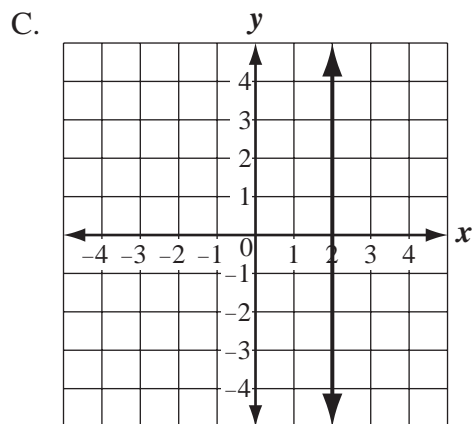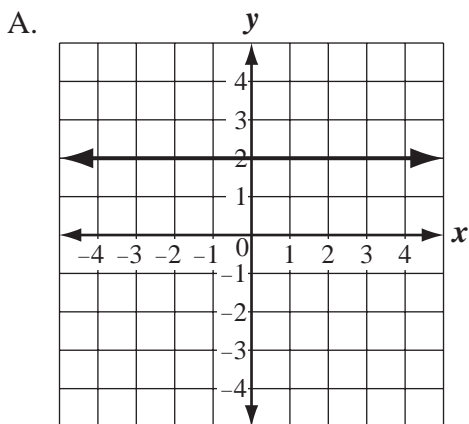
18 Carolyn recorded the temperature, in degrees Fahrenheit, at noon on each day last week. The temperatures are shown in the box below.

77, 72, 81, 82, 77, 75, 69

She will make a stem-and-leaf plot to show the temperatures. Which numbers should Carolyn use for the **stems** in her plot?

A. 6, 7, 8

B. 1, 2, 5, 7, 9

C. 1, 2, 5, 6, 7, 8, 9

D. 69, 72, 75, 77, 81, 82

19 A pentagon and the measures of four of its angles are shown below.
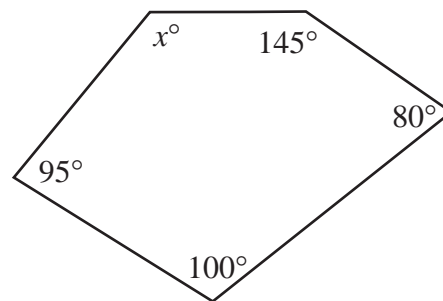
What is the value of x?

A. 145

B. 120

C. 80

D. 60

Question 20 is an open-response question.

- **BE SURE TO ANSWER AND LABEL ALL PARTS OF THE QUESTION.**
- **Show all your work (diagrams, tables, or computations) in your Student Answer Booklet.**
- **If you do the work in your head, explain in writing how you did the work.**

Write your answer to question 20 in the space provided in your Student Answer Booklet.

20 For this question, you will create sets of numbers that satisfy the requirements given in parts (a) through (d). You will create a different set of numbers for each part.

a. Write a data set of any 5 numbers that has a median equal to 7. Explain your reasoning.

b. Write a data set of any 5 numbers that has a mean equal to 9. Explain your reasoning.

c. Write a data set of any 5 numbers that has **both** of the characteristics given below. Explain your reasoning.

- range equal to 8
- mode equal to 6

d. Write a data set of any 5 numbers that has **all** of the characteristics given below. Explain your reasoning.

- mode equal to 6
- median equal to 7
- mean equal to 9

Mark your answer to multiple-choice question 21 in the space provided in your Student Answer Booklet. Do not write your answer in this test booklet. You may do your figuring in the test booklet.

21 The gas tank in Taro's car can hold a total of 18 gallons of gas. Which of the following is closest to the total number of liters of gas the tank can hold? (1 gal ≈ 3.8 liters)

A. 21
B. 50
C. 68
D. 76

Grade 7 Mathematics
Spring 2011 Released Items:
Reporting Categories, Standards, and Correct Answers*

Item No.	Page No.	Reporting Category	Standard	Correct Answer (MC/SA)*
1	207	*Number Sense and Operations*	7.N.8	B
2	207	*Patterns, Relations, and Algebra*	7.P.5	A
3	207	*Measurement*	7.M.3	D
4	208	*Patterns, Relations, and Algebra*	7.P.1	C
5	209	*Patterns, Relations, and Algebra*	7.P.2	–24
6	210	*Geometry*	7.G.7	D
7	210	*Number Sense and Operations*	7.N.6	A
8	211	*Number Sense and Operations*	7.N.9	2
9	212	*Number Sense and Operations*	7.N.9	
10	213	*Geometry*	7.G.6	C
11	213	*Patterns, Relations, and Algebra*	7.P.1	B
12	213	*Patterns, Relations, and Algebra*	7.P.2	C
13	214	*Data Analysis, Statistics, and Probability*	7.D.1	B
14	214	*Patterns, Relations, and Algebra*	7.P.3	C
15	215	*Geometry*	7.G.4	C
16	216	*Measurement*	7.M.1	2.5 pounds
17	217	*Patterns, Relations, and Algebra*	7.P.5	D
18	218	*Data Analysis, Statistics, and Probability*	7.D.1	A
19	218	*Geometry*	7.G.1	B
20	219	*Data Analysis, Statistics, and Probability*	7.D.2	
21	220	*Measurement*	7.M.2	C

* Answers are provided here for multiple-choice items and short-answer items only. Sample responses and scoring guidelines for open-response items, which are indicated by shaded cells, will be posted to the Department's website later this year.