IX. Mathematics, Grade 3

Grade 3 Mathematics Test

The spring 2008 grade 3 MCAS Mathematics test was based on learning standards in the Massachusetts *Mathematics Curriculum Framework* (2000). The *Framework* identifies five major content strands, listed below. Specific learning standards for grade 3 are found in the *Supplement to the Massachusetts Mathematics Curriculum Framework* (2004). Page numbers for the grades 3–4 *Framework* learning standards and for the grade 3 *Supplement* standards appear in parentheses.

- Number Sense and Operations (*Framework*, pages 22–23; *Supplement*, pages 3–4)
- Patterns, Relations, and Algebra (*Framework*, page 32; *Supplement*, page 4)
- Geometry (*Framework*, page 40; *Supplement*, pages 4–5)
- Measurement (*Framework*, page 48; *Supplement*, page 5)
- Data Analysis, Statistics, and Probability (*Framework*, page 56; *Supplement*, pages 5–6)

The *Mathematics Curriculum Framework* and *Supplement* are available on the Department Web site at www.doe.mass.edu/frameworks/current.html.

In *Test Item Analysis Reports* and on the Subject Area Subscore pages of the MCAS *School Reports* and *District Reports*, Mathematics test results are reported under five MCAS reporting categories, which are identical to the five *Framework* content strands listed above.

Test Sessions

The MCAS grade 3 Mathematics test included two separate test sessions. Each session included multiple-choice, short-answer, and open-response questions.

Reference Materials and Tools

Each student taking the grade 3 Mathematics test was provided with a plastic ruler and a grade 3 Mathematics Tool Kit. A copy of the tool kit follows the final question in this chapter. An image of the ruler is not reproduced in this publication.

The use of bilingual word-to-word dictionaries was allowed for current and former limited English proficient students only, during both Mathematics test sessions. No calculators, other reference tools, or materials were allowed.

Cross-Reference Information

The table at the conclusion of this chapter indicates each item's reporting category and the *Framework* learning standard it assesses. The correct answers for multiple-choice and short-answer questions are also displayed in the table.

Mathematics

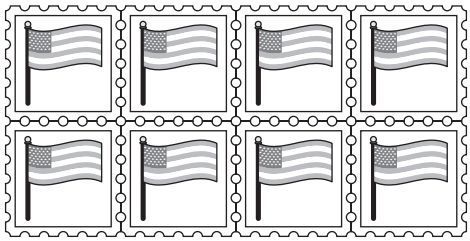
Session 1

You may use your tool kit and MCAS ruler during this session.
*You may **not** use a calculator during this session.*

DIRECTIONS

This session contains twelve multiple-choice questions, two short-answer questions, and two open-response questions. For multiple-choice questions, mark your answers by filling in the circle next to the best answer. For the short-answer and open-response questions, write your answer in the space provided below the question.

1 Robin and Joey had the stamps shown below.



They used some of the stamps to mail letters. Robin used $\frac{3}{8}$ of the stamps and Joey used $\frac{2}{8}$ of the stamps.

What fraction of the stamps did Robin and Joey use altogether?

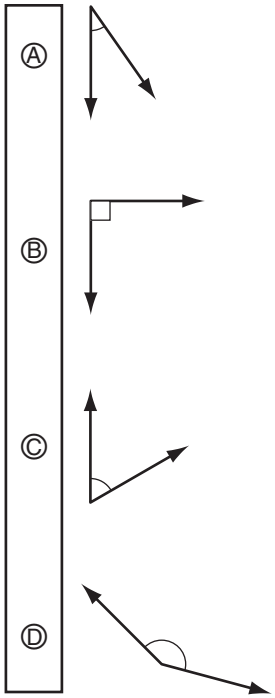
Ⓐ $\frac{1}{16}$

Ⓑ $\frac{1}{8}$

Ⓒ $\frac{5}{16}$

Ⓓ $\frac{5}{8}$

2 Which angle is **greater than** a right angle?

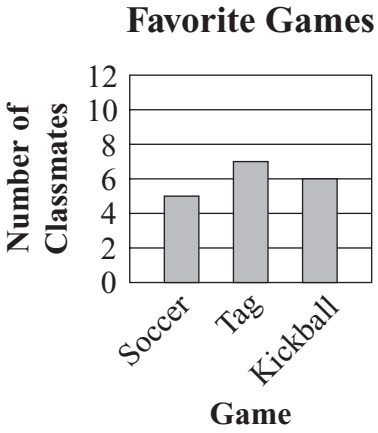


3 Tyrone asked his classmates to vote for their favorite game. Each classmate voted for one game. Their votes are shown below.

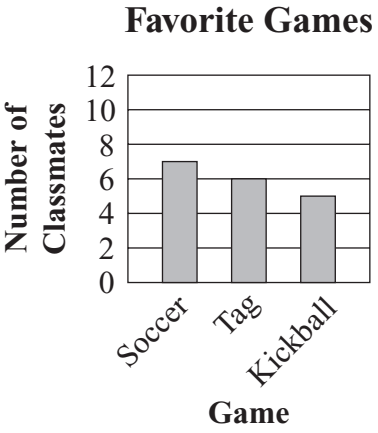
Soccer	Tag	Kickball
Soccer	Tag	Kickball
Soccer	Tag	Kickball
Soccer	Tag	Kickball
Soccer	Tag	Kickball
Tag	Tag	Kickball

Which bar graph correctly shows how many of Tyrone's classmates voted for each game?

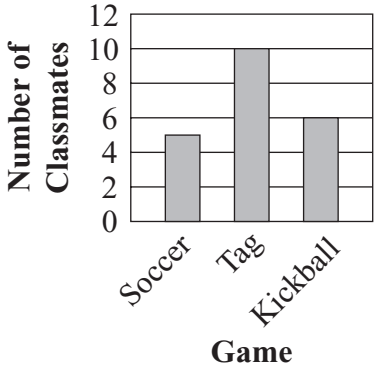
Ⓐ



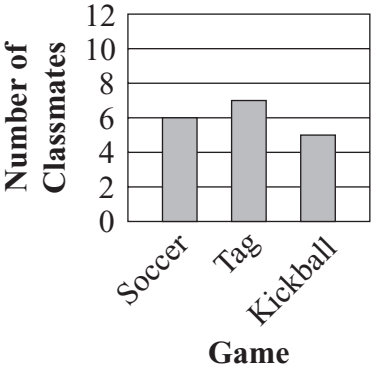
Ⓒ



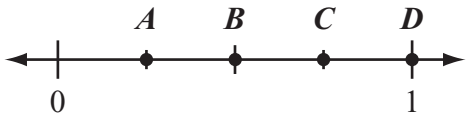
Ⓑ



Ⓓ



4 Points A, B, C, and D are shown on the number line below.



Which point seems to be at $\frac{1}{2}$ on the number line?

Ⓐ point A

Ⓑ point B

Ⓒ point C

Ⓓ point D

5 When Stella got on the bus, she counted all the children on the bus.

At the next stop, 6 children got off the bus.

The number sentence below shows how many children were still on the bus.

$$\square - 6 = 4$$

How many children were on the bus when Stella got on it?

Ⓐ 2

Ⓑ 3

Ⓒ 10

Ⓓ 11

Question 6 is a short-answer question. Write your answer to this question in the Answer Box provided.

Use your MCAS ruler to answer question 6.

6 How many centimeters long is the straw shown below?

Write your answer in the Answer Box below.

Answer Box

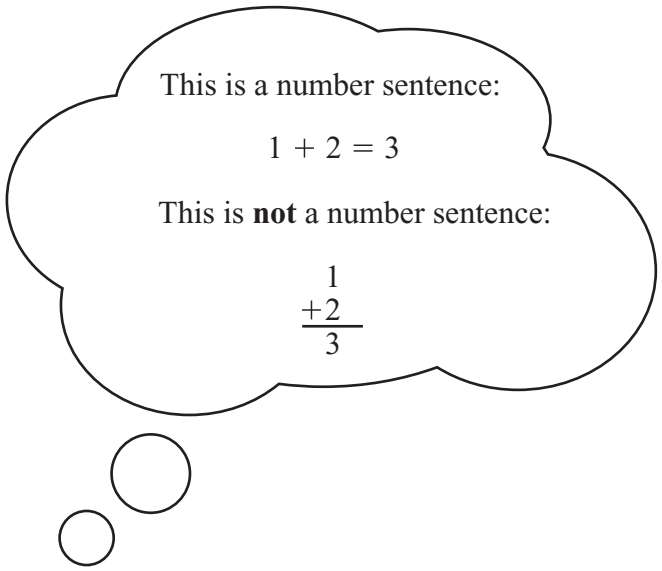
6

Write your answers to parts (a) and (b) of open-response question 7 in the spaces provided.

7 Ms. Evans wrote the problem below on the chalkboard.

- Cam had 30 pennies.
- He put all his pennies into groups. He put 5 pennies in each group.
- How many groups of pennies did Cam have?

a. Write a number sentence using division that shows how many groups of pennies Cam had.



b. Write a number sentence using multiplication that shows how many groups of pennies Cam had.

Mark your choices for multiple-choice questions 8 through 12 by filling in the circle next to the best answer.

8 Which list has **only** multiples of 4?

Ⓐ 4, 14, 24, 34

Ⓑ 4, 40, 41, 42

Ⓒ 8, 14, 18, 24

Ⓓ 8, 12, 16, 20

9 Which symbol belongs in the circle below to make the number sentence true?

$42 \div 6 \bigcirc 10 - 6$

Ⓐ $=$

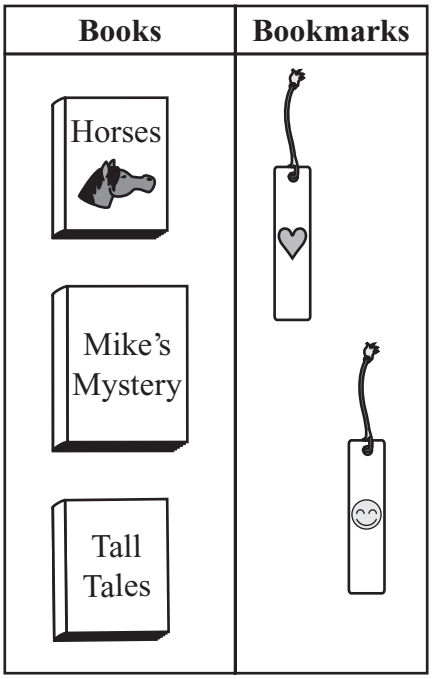
Ⓑ $>$

Ⓒ $<$

Ⓓ $+$

10 The books and bookmarks Emily can choose are shown below.

Emily's Choices



How many different ways can Emily choose 1 book and 1 bookmark?

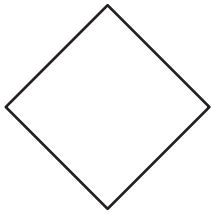
Ⓐ 2

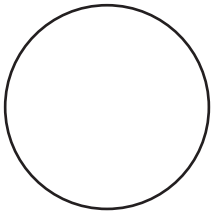
Ⓑ 3

Ⓒ 5

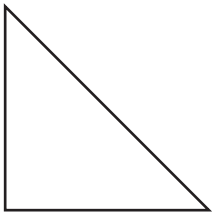
Ⓓ 6

11 Which shape has **only** one line of symmetry?

Ⓐ 

Ⓑ 

Ⓒ 

Ⓓ 

12 The table below shows the numbers of red, blue, and white balloons sold at a parade.

Numbers of Balloons Sold

Color	Balloons
red	38
blue	63
white	57

Which estimate is closest to the total number of balloons sold at the parade?

Ⓐ 140

Ⓑ 160

Ⓒ 170

Ⓓ 200

Question 13 is a short-answer question. Write your answer to this question in the Answer Box provided.

13 Ms. Levett planted 4 sunflower seeds in her front yard and 5 sunflower seeds in her back yard. She has 6 sunflower seeds left.

In the Answer Box below, write the total number of sunflower seeds that Ms. Levett had when she started planting.

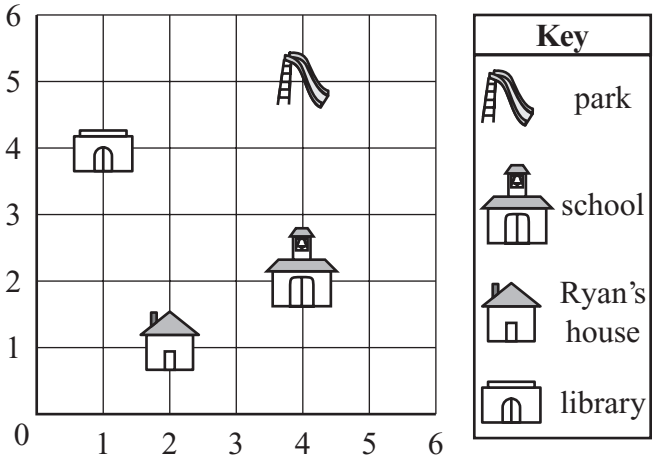
Answer Box

13

Mark your choices for multiple-choice questions 14 and 15 by filling in the circle next to the best answer.

14 The map below shows some of the places in Ryan's neighborhood.

Ryan's Neighborhood



Which ordered pair best shows where the school is?

Ⓐ (4, 2)

Ⓑ (3, 5)

Ⓒ (2, 4)

Ⓓ (2, 1)

15 Three children collected stickers.

- David collected the fewest stickers.
- Betty collected 52 stickers.
- Craig collected 74 stickers.

Which of these could be the number of stickers that David collected?

Ⓐ 61

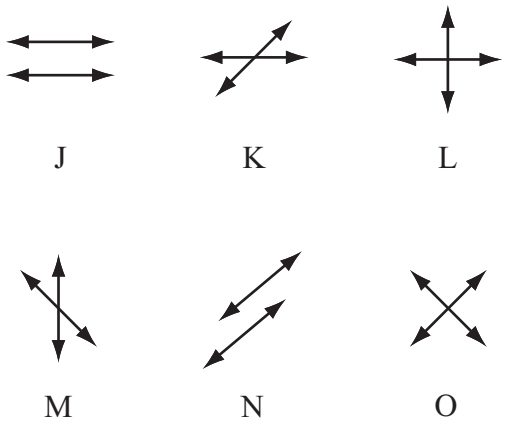
Ⓑ 76

Ⓒ 49

Ⓓ 54

Write your answers to parts (a) and (b) of open-response question 16 in the spaces provided.

16 Phil drew the pairs of lines shown below.



a. List the letters of **all** of the pairs where the two lines seem to be parallel.

b. List the letters of **all** of the pairs where the two lines seem to be perpendicular.

Mathematics

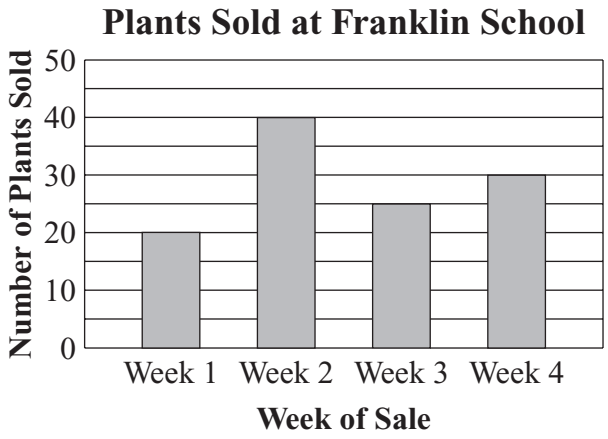
SESSION 2

You may use your tool kit and MCAS ruler during this session.
*You may **not** use a calculator during this session.*

DIRECTIONS

This session contains thirteen multiple-choice questions, three short-answer questions, and three open-response questions. For multiple-choice questions, mark your answers by filling in the circle next to the best answer. For the short-answer and open-response questions, write your answer in the space provided below the question.

17 The students at Franklin School had a plant sale. The bar graph below shows the number of plants sold in each week of the sale.



How many plants were sold in Week 3?

Ⓐ 20
Ⓑ 25
Ⓒ 30
Ⓓ 35

18 What is the missing number that makes the number sentence below true?

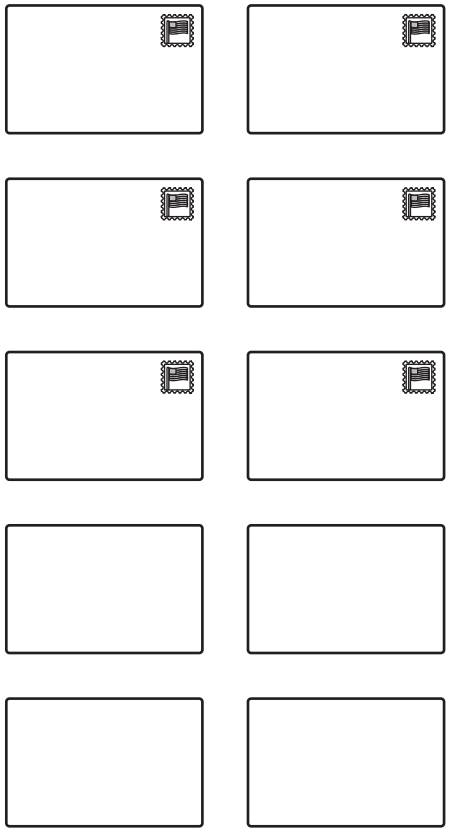
$$3 \times \square = 21$$

Ⓐ 6
Ⓑ 7
Ⓒ 8
Ⓓ 9

19 What is 867 rounded to the nearest hundred?

Ⓐ 800
Ⓑ 860
Ⓒ 870
Ⓓ 900

20 Hank put stamps on some postcards, as shown below.



What fraction of the postcards have a stamp?

Ⓐ $\frac{1}{2}$

Ⓑ $\frac{6}{10}$

Ⓒ $\frac{4}{6}$

Ⓓ $\frac{10}{6}$

21 Matt saved the same amount of money each week for seven weeks. The table below shows the total amount of money he had saved by the end of each week.

Matt's Savings

Week	Total Saved
1	$ 4
2	$ 8
3	$12
4	$16
5	$20
6	
7	?

What is the total amount of money Matt had saved by the end of Week 7?

Ⓐ $24

Ⓑ $26

Ⓒ $28

Ⓓ $32

Question 22 is a short-answer question. Write your answer to this question in the Answer Box provided.

22 The pictograph below shows the numbers of cars that passed Center School at different times one morning.

Cars Passing Center School

Time	Number of Cars
From 9:00 to 10:00	
From 10:00 to 11:00	
From 11:00 to 12:00	

Key
 stands for 5 cars

How many cars passed Center School from 11:00 to 12:00 that morning? Write your answer in the Answer Box below.

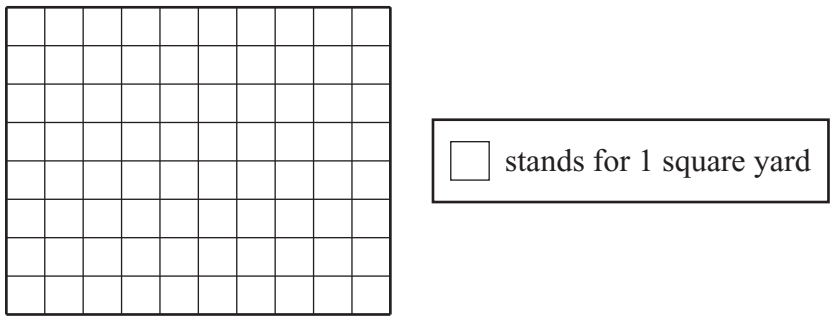
Answer Box

22

Write your answers to parts (a) and (b) of open-response question 23 in the spaces provided.

23 Morgan made the drawing below to show the area of the library.

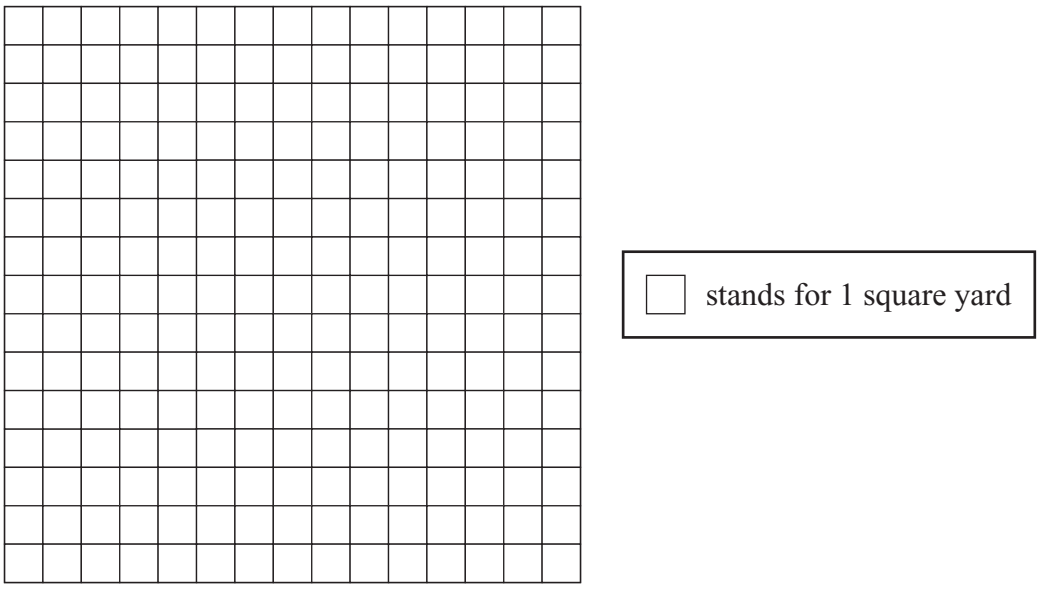
Library



a. What is the area, in square yards, of the library?

The area of Morgan's classroom is 36 square yards.

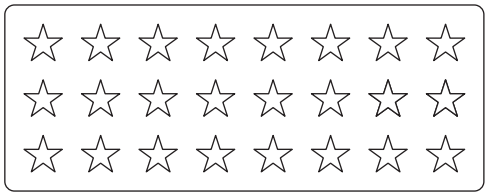
b. On the grid below, draw a rectangle with an area of 36 square yards.



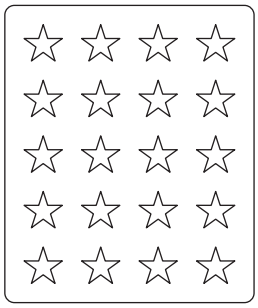
Mark your choices for multiple-choice questions 24 through 28 by filling in the circle next to the best answer.

24 Which array shows $4 \times 6 = 24$ and $24 \div 6 = 4$?

Ⓐ



Ⓑ



Ⓒ

Ⓓ

25 The number of students at Park Hill School who were absent each day last week is shown in the tally chart below.

Students Absent at Park Hill School

Day	Number of Students
Monday	𝍸 𝍸 ||
Tuesday	𝍸
Wednesday	𝍸 ||
Thursday	𝍸 |||
Friday	𝍸 𝍸 𝍸

How many more students were absent on Friday than were absent on Wednesday?

Ⓐ 6
Ⓑ 7
Ⓒ 8
Ⓓ 9

26 What is the missing number that makes the number sentence below true?

$$10 + 8 + \square = 8 + 2 + 10$$

Ⓐ 2
Ⓑ 8
Ⓒ 18
Ⓓ 20

27 At North School there are 462 students. At South School there are 398 students.

Which of these correctly compares the numbers of students at the schools?

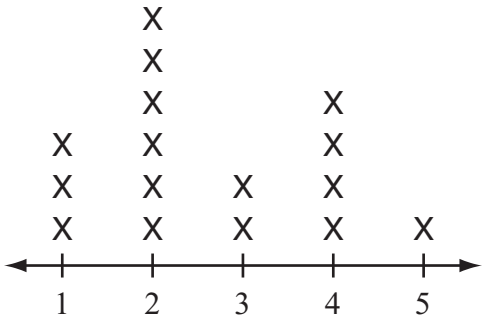
Ⓐ $462 + 398$

Ⓑ $462 > 398$

Ⓒ $462 = 398$

Ⓓ $462 < 398$

28 The line plot below shows the numbers of books some students read over the summer.



Number of Books Read over the Summer

How many students read **fewer than** 3 books?

Ⓐ 2

Ⓑ 3

Ⓒ 6

Ⓓ 9

Question 29 is a short-answer question. Write your answer to this question in the Answer Box provided.

29 Cathy's classroom is 9 yards long.
How many feet long is Cathy's classroom? (1 yard = 3 feet)

Write your answer in the Answer Box below.

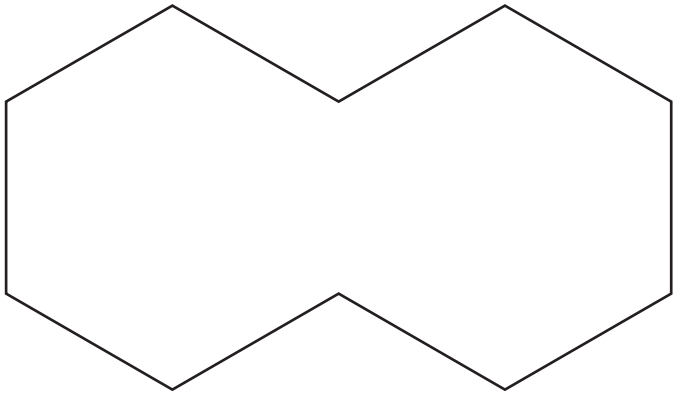
Answer Box

29

Write your answer to open-response question 30 in the space provided.

Use the shape R *pieces from your tool kit to answer question 30.*

30 Enrique covered the figure below using only shape R pieces.



What fraction of Enrique's figure is one shape R piece? Explain how you got your answer.

Mark your choices for multiple-choice questions 31 through 33 by filling in the circle next to the best answer.

31 Jason read 20 pages of a book each night.

How many pages in all did Jason read in 7 nights?

Ⓐ 80

Ⓑ 90

Ⓒ 120

Ⓓ 140

32 Barb wrote the pattern shown below.

71, 67, 63, 59, 55

Which of these could be the rule for Barb's pattern?

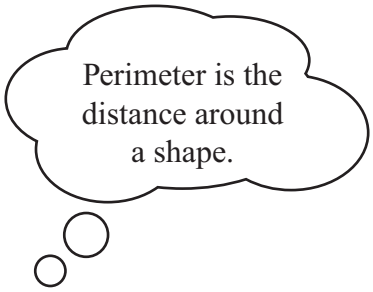
Ⓐ subtract 4

Ⓑ add 6

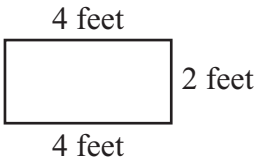
Ⓒ subtract 14

Ⓓ add 16

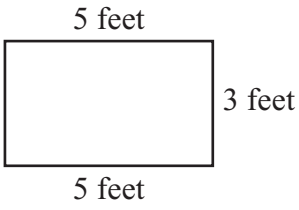
33 Which rectangle has a perimeter of 16 feet?



Ⓐ



Ⓑ



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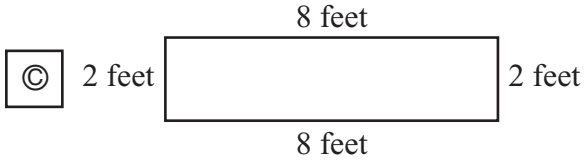
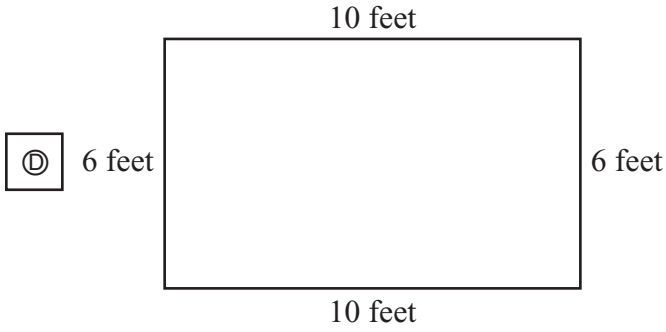


Ⓓ



Question 34 is a short-answer question. Write your answer to this question in the Answer Box provided.

34 Ian is thinking of a number. The clues to find his number are given below.

- His number has only the digits 3, 6, and 9.
- Each digit is used only once.
- His number is an even number.
- His number is greater than 400.

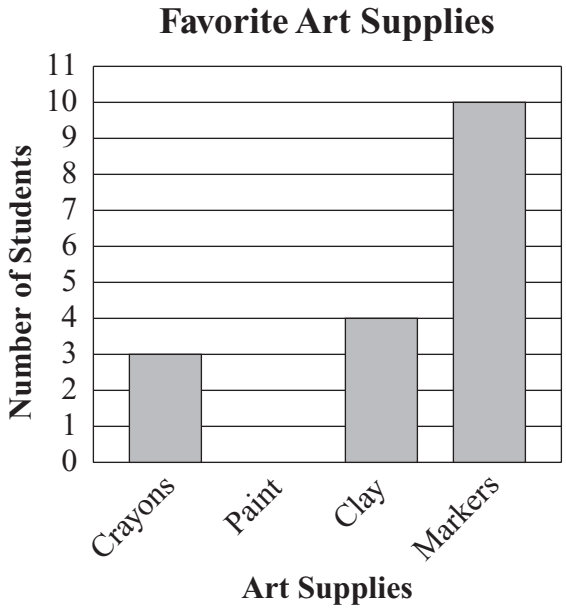
In the Answer Box below, write Ian's number.

Answer Box

34

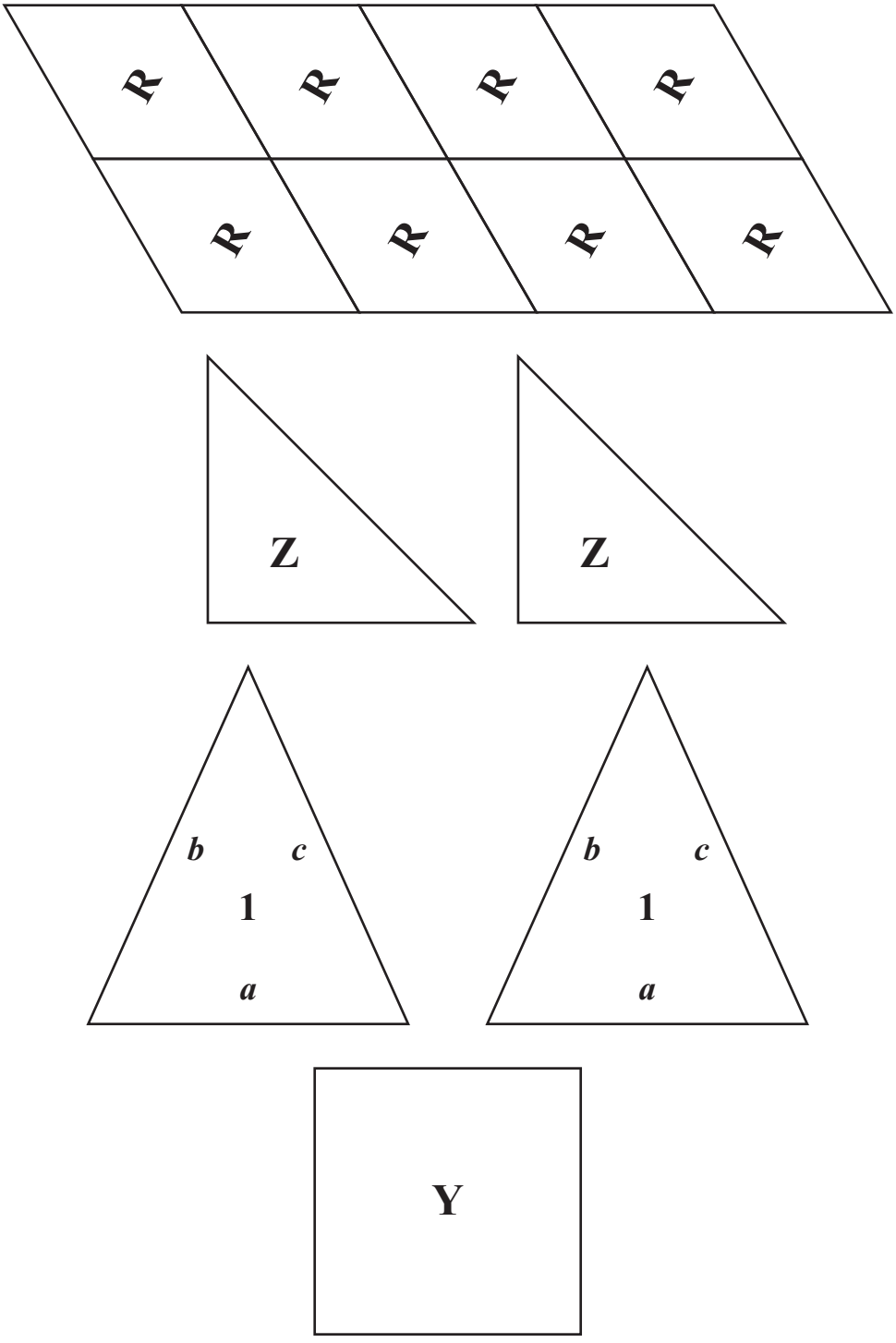
Write your answer to open-response question 35 in the space provided.

35 Sue is making the bar graph below to show the favorite art supplies of the students in her art class.



There are 25 students in Sue's art class. All of the students chose crayons, paint, clay, or markers as their favorite art supply.

Complete the bar graph to show the number of students who chose paint as their favorite art supply. Explain how you got your answer.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Y

Grade 3 Mathematics
Spring 2008 Released Items:
Reporting Categories, Standards, and Correct Answers*

Item No.	Page No.	Reporting Category	Standard	Correct Answer (MC/SA)*
1	233	*Number Sense and Operations*	3.N.13	D
2	233	*Geometry*	3.G.3	D
3	234	*Data Analysis, Statistics, and Probability*	3.D.2	A
4	235	*Number Sense and Operations*	3.N.4	B
5	235	*Patterns, Relations, and Algebra*	3.P.3	C
6	236	*Measurement*	3.M.5	12 centimeters
7	237	*Patterns, Relations, and Algebra*	3.P.4	
8	238	*Number Sense and Operations*	3.N.5	D
9	238	*Patterns, Relations, and Algebra*	3.P.2	B
10	238	*Data Analysis, Statistics, and Probability*	3.D.4	D
11	239	*Geometry*	3.G.1	D
12	239	*Number Sense and Operations*	3.N.12	B
13	240	*Number Sense and Operations*	3.N.8	15
14	241	*Geometry*	3.G.5	A
15	241	*Number Sense and Operations*	3.N.2	C
16	242	*Geometry*	3.G.4	
17	243	*Data Analysis, Statistics, and Probability*	3.D.3	B
18	243	*Patterns, Relations, and Algebra*	3.P.3	B
19	243	*Number Sense and Operations*	3.N.11	D
20	244	*Number Sense and Operations*	3.N.3	B
21	244	*Patterns, Relations, and Algebra*	3.P.1	C
22	245	*Data Analysis, Statistics, and Probability*	3.D.3	30
23	246	*Measurement*	3.M.1	
24	247	*Number Sense and Operations*	3.N.6	D
25	248	*Data Analysis, Statistics, and Probability*	3.D.3	C
26	248	*Number Sense and Operations*	3.N.7	A
27	249	*Patterns, Relations, and Algebra*	3.P.4	B
28	249	*Data Analysis, Statistics, and Probability*	3.D.3	D
29	250	*Measurement*	3.M.2	27 feet
30	251	*Number Sense and Operations*	3.N.3	
31	252	*Number Sense and Operations*	3.N.9	D
32	252	*Patterns, Relations, and Algebra*	3.P.1	A
33	253	*Measurement*	3.M.4	B
34	254	*Number Sense and Operations*	3.N.1	936
35	255	*Data Analysis, Statistics, and Probability*	3.D.3	

***** 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 Web site later this year.