

Name _____

Minnesota Comprehensive Assessments-Series III

Mathematics Item Sampler
Grade 6



ITEM SAMPLERS ARE NOT SECURE TEST MATERIALS. THIS ITEM
SAMPLER TEST BOOK MAY BE COPIED OR DUPLICATED.

Minnesota Department of
Education

Grade 6 Formula Sheet

You may use the following formulas to solve problems on this test.

Formulas	Variables
$A = bh$ $A = \frac{1}{2}bh$ $A = \frac{1}{2}h(b_1 + b_2)$	$A =$ area $b =$ base $h =$ height
$V = Bh$	$B =$ area of base $h =$ height $V =$ volume
$s = 180(n - 2)$	$n =$ number of sides $s =$ sum of angles

Mathematics Test General Directions

- This test contains four segments.
- You may write in this test book as scratch paper. Grid paper is also provided at the back of the test book.
- You will find a formula sheet at the beginning of this test book. You may tear it out of your test book to use while taking the test.
- For each question, choose the answer you think is best.
- Look at the sample questions that show how the different types of questions should be answered.

Multiple-choice Question Answered in Test Book:

$$20 - 8 =$$

- A. 8
- B. 10
- C. 12
- D. 16

- Answer each fill in the blank question by writing your answer in the space below the question. You may only use the digits 0–9 and the symbols for fraction (/) and decimal (.). Do not include a label on your answer. If your answer is a mixed number you must change it to an improper fraction or a decimal.

Fill in the Blank Question Answered in Test Book:

$$\frac{1}{4} + 1\frac{1}{4} = 6/4$$

- You **may not** use a calculator for Segment 1.
- You **may** use a calculator for Segments 2, 3, and 4.
- When you finish a segment of the test, stop and check your answers. Then use the sticker given to you to seal it. Once you seal a segment, you cannot go back to it. Each segment must be sealed before you move on to the next segment.

The General Direction page is the same as it appears in the test. The item sampler will only have 2 segments. You may use a calculator for Segment 2.



On this test, do your own best work to show what you know and can do.

- Do not accept help finding answers to test questions.
- Do not give answers to other students.
- Do not tell others what is on the test.
- There may be consequences if you do not follow directions or if you behave dishonestly.

Segment 1

You will be told when to begin this segment.

You **MAY NOT** use a calculator for this segment.





1. Which is equivalent to 4^3 ?

- A. 12
- B. 48
- C. 64
- D. 81

2. Divide.

$$1\frac{1}{10} \div 1\frac{1}{5}$$

- A. $\frac{11}{12}$
- B. $\frac{25}{33}$
- C. $1\frac{8}{25}$
- D. $1\frac{1}{2}$



3. Riley has 200 stamps.

- 35% are from Europe.
- 10% are from Asia.
- 20% are from Australia.

The rest of the stamps are from North America. How many of Riley's stamps are from North America?

- A. 35
 - B. 65
 - C. 70
 - D. 130
-

4. What is the prime factorization of 630?

- A. $2 \times 3 \times 5 \times 7$
- B. $2 \times 3^2 \times 5 \times 7$
- C. $2 \times 3^2 \times 35$
- D. $2 \times 5 \times 7 \times 9$



5. An equation is shown.

1

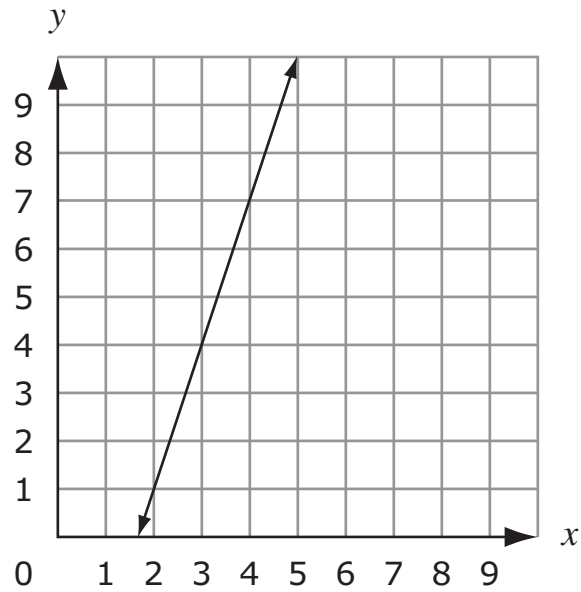
$$j = 7k + 5$$

When the value of k increases by 2, by what amount does the value of j increase?

- A. 2
- B. 9
- C. 12
- D. 14



6. A graph is shown.



What is the equation of the line on the graph?

- A. $y = x - 1$
- B. $y = x + 3$
- C. $y = 3x + 1$
- D. $y = 3x - 5$



1

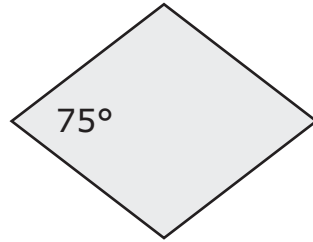
7. Simplify.

$$4\left(\frac{1}{2} + \frac{3}{8}\right) - \frac{5}{8} \cdot 2$$

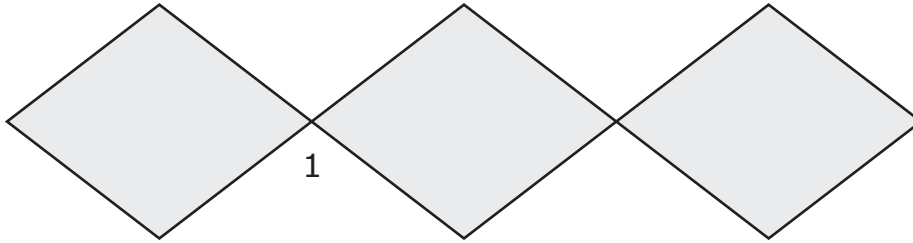
- A. $1\frac{1}{8}$
- B. 2
- C. $2\frac{1}{4}$
- D. $5\frac{3}{4}$



8. A rhombus is shown.



The rhombus is used to make a design.



What is $m\angle 1$?

- A. 15°
- B. 75°
- C. 105°
- D. 150°

Put sticker
here

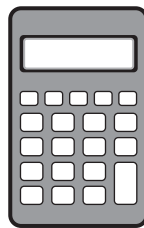
This is the end of Segment 1.
Check your work. Then seal this segment.



Segment 2

You will be told when to begin this segment.

You **MAY** use a calculator for this segment.





Mathematics Test — Segment 2

9. Which statement is true?

A. $\frac{1}{6} = 0.16$

B. $0.08 = \frac{4}{5}$

C. $0.25 < \frac{1}{4}$

D. $\frac{1}{3} > 0.3$

2

10. Kelly makes 12 candles in 3 hours. Lee makes 6 candles in 1 hour. What is the difference in the numbers of candles they each make in 8 hours?

A. 2

B. 8

C. 16

D. 48

11. A bottle of soap costs \$3.45 for 64 ounces. What is the cost per ounce?

A. \$0.05

B. \$0.19

C. \$0.22

D. \$0.64

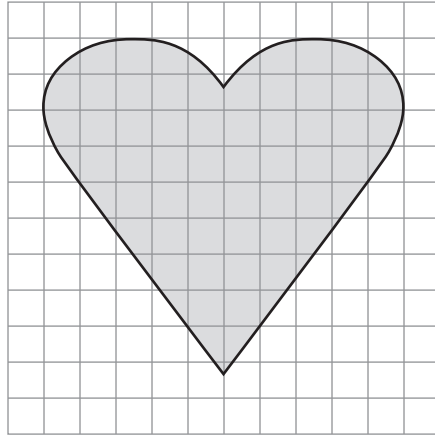


- 12.** A company is printing 250 calendars. In 1 hour, 75 calendars are printed. What percent of the calendars are printed in 1 hour?
- A.** 3%
 - B.** 3.3%
 - C.** 30%
 - D.** 33%
-

- 13.** The surface area of a cube is 384 square inches. What is the volume of the cube?
- A.** 8 cubic inches
 - B.** 16 cubic inches
 - C.** 256 cubic inches
 - D.** 512 cubic inches



14. A heart shape is cut from a gridded piece of paper.



2

What is the approximate area of the heart?

- A.** 50 square units
- B.** 70 square units
- C.** 90 square units
- D.** 144 square units

15. Joleen bought 12 apples. Each apple weighed 1.8 ounces. How many pounds of apples did Joleen buy?

- A.** 1.35 pounds
- B.** 2.4 pounds
- C.** 21.6 pounds
- D.** 28.8 pounds



Please write your answer in the space below the question. You may use the digits: 0-9 and the symbols: slash for a fraction bar (/) and a decimal (.). If your answer is a mixed number you must change it to an improper fraction or a decimal.

16. Eli has a cube with sides numbered 1–6 and a spinner with 3 equal sections labeled A, B, and C. He rolls the cube and spins the spinner. How many outcomes are possible?

-
17. Four students each flipped a coin 50 times and recorded the results in the table.

Student	Heads	Tails
Mai Ka	31	19
Heather	15	35
Jose	21	29
Tyrone	20	30

Who had a relative frequency of $\frac{3}{5}$ of flipping tails?

- A. Mai Ka
- B. Heather
- C. Jose
- D. Tyrone



18. Which is equivalent to 0.04%?

- A. $\frac{1}{4}$
- B. $\frac{1}{25}$
- C. $\frac{1}{400}$
- D. $\frac{1}{2,500}$

2

19. What is the greatest common factor of 48 and 64?

- A. 2
- B. 8
- C. 16
- D. 24

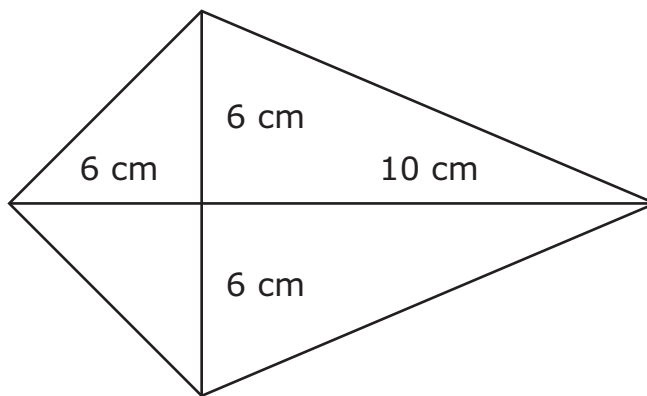
20. A paint color is made using 4 drops of red and 5 drops of blue for each 5 gallons of paint. How many gallons of paint are being colored when 45 drops of color are used?

- A. 9
- B. 25
- C. 45
- D. 81



- 21.** A phone company uses the equation $y = 0.15x + 10$ to find y , the monthly charge for a customer sending x text messages. How many text messages are sent if the monthly charge is \$77.50?
- A.** 10
 - B.** 21
 - C.** 450
 - D.** 506

-
- 22.** A scale drawing of a kite is shown.

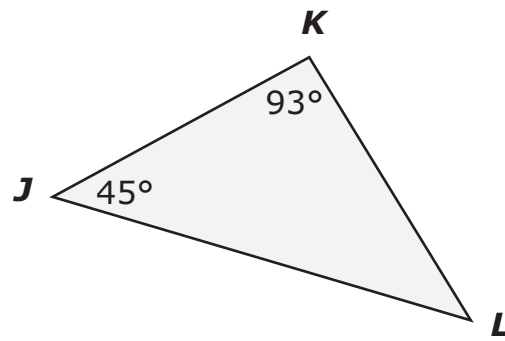


What is the area of the kite?

- A.** 28 cm^2
- B.** 60 cm^2
- C.** 96 cm^2
- D.** 192 cm^2



23. A triangle is shown.



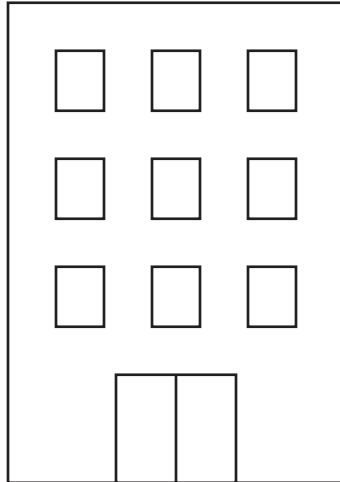
What is $m\angle L$?

- A. 42°
- B. 45°
- C. 48°
- D. 138°

2



24. A building has 9 windows. Each window is 5 feet tall.



About how tall is the building?

- A.** 15 feet
- B.** 25 feet
- C.** 40 feet
- D.** 45 feet

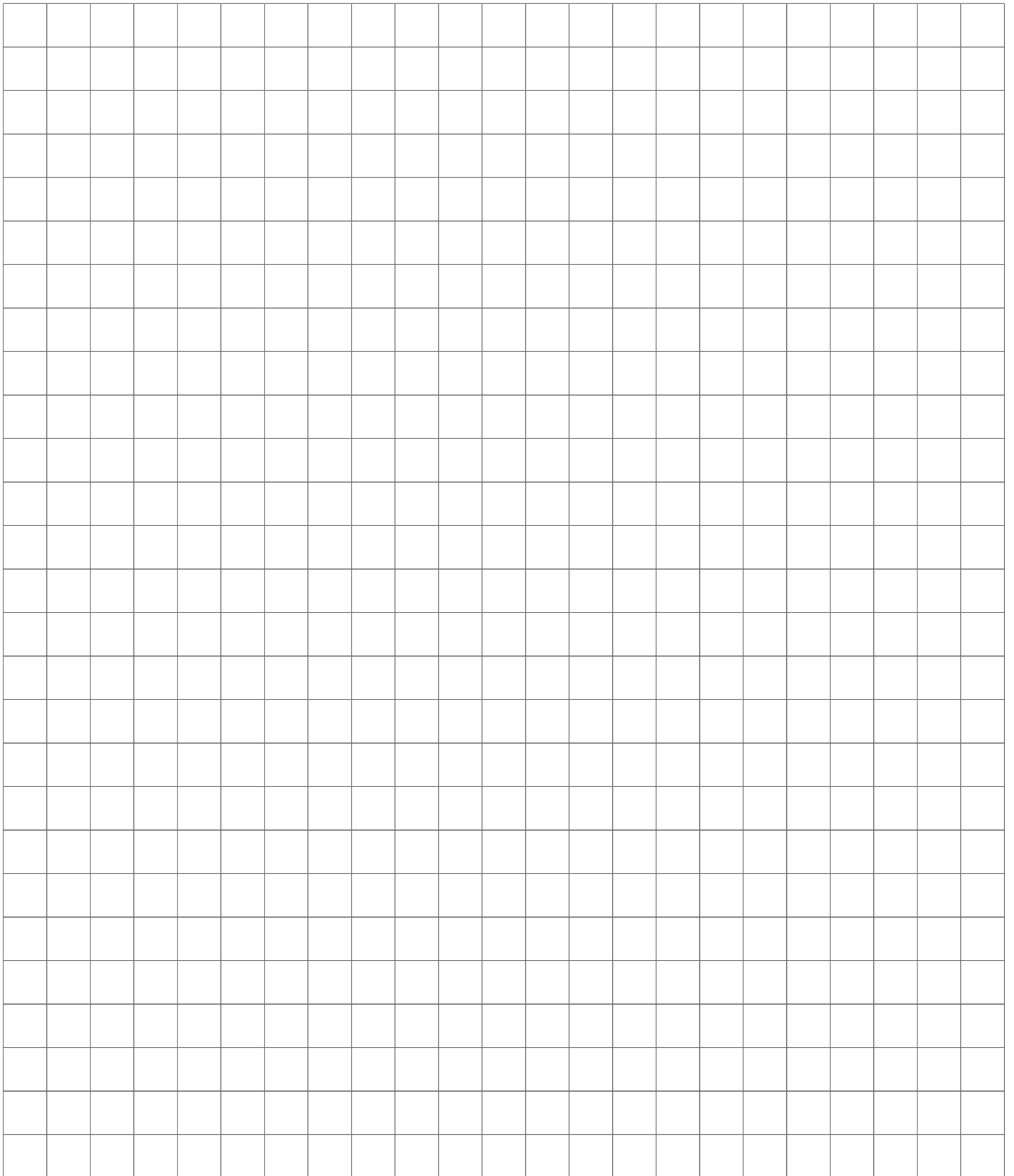
25. Tyler has a stack of cards. He picks a card, records the color, and returns the card to the stack. He repeats this 60 times and chooses a red card 24 times. What is the experimental probability of choosing a red card from the stack?

- A.** 0.14
- B.** 0.23
- C.** 0.40
- D.** 2.50

Put sticker
here

This is the end of Segment 2.
Check your work. Then seal this segment.





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Grade 6 Teacher's Guide



MCA Item Sampler Teacher's Guide

mde.testing@state.mn.us

An Introduction to the MCA

The Minnesota Comprehensive Assessments are reading, mathematics and science tests that help schools and districts measure student progress toward the state's academic standards. The grades 3–8 mathematics assessments became operational in 2011 as the Minnesota Comprehensive Assessments-Series III (MCA-III) and are aligned to the 2007 Minnesota Academic Standards. In 2012, the science assessments became operational as the Minnesota Comprehensive Assessments-Series III (MCA-III) and are aligned to the 2009 Minnesota Academic Standards. In 2013, the grades 3-8 and 10 reading assessments are aligned to the 2010 Minnesota Academic Standards as the Minnesota Comprehensive Assessments-Series III (MCA-III). In 2014, the grade 11 mathematics assessment is aligned to the 2007 Minnesota Academic Standards as the Minnesota Comprehensive Assessments-Series III (MCA-III).

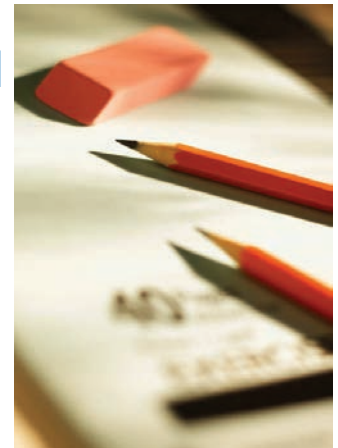
The Purpose of the MCA Item Samplers

An item sampler is not a complete test. It contains a smaller number of the items that students will see on a full-length test in the spring. The MCA Item Samplers were developed to familiarize students and teachers with the format of the MCA and the kinds of items that will appear on them.

This MCA Item Sampler is not a real test. It should not be used to predict how well students will do on the tests. However, students may feel more comfortable with the tests if they have reviewed the Item Samplers prior to the test.

How the MCA Item Samplers Were Created

The Item Samplers mirror the format of the MCA. The student directions, segment layouts, and answer sheet each reflect the way the test will look in the spring, except that the Item Sampler is shorter than the actual test. As with all MCAs, the reading passages and the math and reading questions have been thoroughly reviewed by Minnesota teachers prior to testing. Minnesota students have answered these questions on previous tests.



Grade 6 Teacher's Guide

The distribution of question types and their aligned content selected for the Item Sampler generally reflects a range of items from each strand in the Minnesota Academic Standards. Whenever possible, the Item Samplers have the following designs:

Math:

- Two segments
 - Segment One does not allow a student to use a calculator.
 - The actual MCA has four segments
- Approximately twenty-four multiple-choice items

The Contents of This Teacher's Guide

The Answer Key identifies the answers and solutions to the questions. It also identifies the strand/sub-strand/benchmark from the Minnesota Academic Standards for the question.

State Standards & Test Specifications

The Item Samplers are primarily intended to familiarize teachers and students with the **format** of the MCA. The best preparation for the **content** of the MCA is done as a part of your curriculum planning. When doing that, reference the Minnesota Academic Standards and the test specifications for the MCA. For further questions about the MCAs, email us at mde.testing@state.mn.us.

Grade 6 Teacher's Guide

Mathematics MCA Item Sampler Answer Key Grade 6 Math

Item #	Correct Answer	Item Type	Strand	Standard	Benchmark
1	C	MC	1	1	07
2	A	MC	1	3	01
3	C	MC	1	1	03
4	B	MC	1	1	05
5	D	MC	2	1	01
6	D	MC	2	1	02
7	C	MC	2	2	01
8	C	MC	3	2	01
9	D	MC	1	1	02
10	C	MC	1	2	01
11	A	MC	1	2	03
12	C	MC	1	3	03
13	D	MC	3	1	01
14	A	MC	3	1	03
15	A	MC	3	3	01
16	Grid	GR	4	1	01
17	D	MC	4	1	03
18	D	MC	1	1	04
19	C	MC	1	1	06
20	B	MC	1	2	02
21	C	MC	2	3	02
22	C	MC	3	1	02
23	A	MC	3	2	02
24	C	MC	3	3	02
25	C	MC	4	1	04

Grade 6 Teacher's Guide

Item # — The number of the question in the Item Sampler.

Correct Answer — Answers to multiple-choice questions are listed.

Item Type — Multiple Choice (**MC**) and Gridded Response (**GR**)

Strand — In mathematics, the MCA-III measures four strands:

1. Number and Operation
2. Algebra
3. Geometry and Measurement
4. Data Analysis and Probability

Standard — Each strand has one or more standards

Benchmark — Each standard has one or more benchmarks. See the Academic Standards or test specification for further explanation of each benchmark.