

Grade

4

**meap**<sup>TM</sup>  
Michigan Educational Assessment Program

# Item Descriptors

4th

5th

6th

7th

8th



**MATHEMATICS**  
**FALL 2013**

**MICHIGAN STATE BOARD OF EDUCATION**  
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***NOTE: For each item listed throughout this booklet, the first statement is a summary of the Michigan Grade Level Content Expectation (GLCE) and the second statement is the descriptor for the item's stem or question.***

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Students were instructed to read the directions below silently as the test administrator read them aloud.

## PART 1

### DIRECTIONS:

In this part, you will answer multiple-choice mathematics questions. Some questions will ask you to view a picture, chart, or other mathematics-related information. Use that information with what you know to answer the question. You may **NOT** use a calculator for this part of the test.

You must mark all of your answers in Part 1 of your **Answer Document** with a No. 2 pencil. You may underline, circle, or write in this test booklet to help you, but nothing marked in this test booklet will be scored. No additional paper may be used.

Mark only one answer for each question. Completely fill in the corresponding circle on your **Answer Document**. If you erase an answer, be sure to erase completely. Remember that if you skip a question in the test booklet, you need to skip the answer space for that question on the **Answer Document**. If you are not sure of an answer, mark your **best** choice.

A sample question is provided for you below.

### Sample Multiple-Choice Question:

Marty wants to put 75 CDs into cases. Each case holds exactly 8 CDs. What is the **least** number of cases that Marty will need to hold all his CDs?

- A 8
- B 9
- C 10
- D 11

For this sample question, the correct answer is **C**. Circle **C** is filled in for the sample question on your **Answer Document**.

Once you have reached the word **STOP** in your test booklet, do **NOT** go on to the next page. If you finish early, you may go back and check your work in Part 1 of the test **ONLY**. Check to make sure that you have answered every question. Do **NOT** look at any other part of the test.

NOTE: The directions for Part 2 are the same as the above instructions, but with calculators allowed.

- 1 N.ME.03.03:** Compare and order numbers up to 10,000.

Order four 3-digit numbers from least to greatest.

- A** mixed order
- B** correct
- C** mixed order
- D** greatest to least

- 2 N.ME.03.18:** Place fractions with denominators of 2, 4, and 8 on the number line; relate the number line to a ruler; compare and order up to three fractions with denominators 2, 4, and 8.

Identify location of shape on number line.

- A** complement
- B** chose labeled fraction
- C** correct
- D** incorrect use of scale

- 3 N.ME.03.17:** Recognize, name, and use equivalent fractions with denominators 2, 4, and 8, using strips as area models.

Identify the shaded portion of the fraction strip.

- A** complement
- B** ratio of non-shaded to shaded portion
- C** incorrect fraction
- D** correct

- 4 N.FL.03.06:** Add and subtract fluently two numbers through 999 with regrouping and through 9,999 without regrouping.

Subtract in context.

- A** under by 10
- B** subtracted in tens place but added in ones place
- C** correct
- D** added

- 5 N.FL.03.06:** Add and subtract fluently two numbers through 999 with regrouping and through 9,999 without regrouping.

Subtract in context.

- A** under by 10
- B** incorrect subtraction
- C** correct
- D** subtracted smaller values from larger values

- 6 N.FL.03.07:** Estimate the sum and difference of two numbers with three digits (sums up to 1,000), and judge reasonableness of estimates.

Estimate the sum of two 3-digit numbers.

- A** estimate of one addend
- B** underestimate, possibly truncated
- C** correct
- D** overestimate

- 7 N.FL.03.11:** Find products fluently up to  $10 \times 10$ ; find related quotients using multiplication and division relationships.

Find product of two numbers.

- A** divided
- B** subtracted
- C** added
- D** correct

- 8 N.ME.03.05:** Know that even numbers end in 0, 2, 4, 6, or 8; name a whole number quantity that can be shared in two equal groups or grouped into pairs with no remainders; recognize even numbers as multiples of 2. Know that odd numbers end in 1, 3, 5, 7, or 9. Work with patterns involving even and odd numbers.

Identify the odd number.

- A** correct
- B** odd in tens place
- C** odd in tens place
- D** even in both ones and tens place

- 9 N.ME.03.05:** Know that even numbers end in 0, 2, 4, 6, or 8; name a whole number quantity that can be shared in two equal groups or grouped into pairs with no remainders; recognize even numbers as multiples of 2. Know that odd numbers end in 1, 3, 5, 7, or 9. Work with patterns involving even and odd numbers.

Determine next three numbers in skip-counting pattern.

- A** skip counted by 1, not 2
- B** skip counted by 2, then by 1
- C** correct
- D** skip counted by 2, then by 4

- 10 D.RE.03.02:** Read scales on the axes and identify the maximum, minimum, and range of values in a bar graph.

Find the minimum of the data in a bar graph.

- A** neither maximum nor minimum
- B** neither maximum nor minimum
- C** maximum
- D** correct

- 11 N.ME.03.05:** Know that even numbers end in 0, 2, 4, 6, or 8; name a whole number quantity that can be shared in two equal groups or grouped into pairs with no remainders; recognize even numbers as multiples of 2. Know that odd numbers end in 1, 3, 5, 7, or 9. Work with patterns involving even and odd numbers.

Identify list with only even numbers.

- A** 4 consecutive whole numbers
- B** correct
- C** two even numbers, two odd numbers
- D** 3 even numbers, one odd number

- 12 M.TE.03.09:** Estimate the perimeter of a square and rectangle in inches and centimeters; estimate the area of a square and rectangle in square inches and square centimeters.

Estimate perimeter of rectangle in inches.

- A** area
- B** length + length
- C** correct
- D** overestimated by 2 inches

- 13 G.GS.03.06:** Identify, describe, build and classify familiar three-dimensional solids, e.g., cube, rectangular prism, sphere, pyramid, cone, based on their component parts (faces, surfaces, bases, edges, vertices).

Identify number of edges on 3-D shape.

- A** number of edges on one face
- B** number of faces
- C** number of vertices
- D** correct

- 14 G.GS.03.04:** Identify, describe, compare, and classify two-dimensional shapes, e.g., parallelogram, trapezoid, circle, rectangle, square, and rhombus, based on their component parts (angles, sides, vertices, line segment) and the number of sides and vertices.

Identify quadrilateral.

- A** correct
- B** not quadrilateral
- C** not quadrilateral
- D** not quadrilateral

- 15 G.GS.03.04:** Identify, describe, compare, and classify two-dimensional shapes, e.g., parallelogram, trapezoid, circle, rectangle, square, and rhombus, based on their component parts (angles, sides, vertices, line segment) and the number of sides and vertices.

Identify 2-D shape given characteristics.

- A** incorrect shape
- B** correct
- C** incorrect shape
- D** incorrect shape

- 16 N.ME.03.17:** Recognize, name, and use equivalent fractions with denominators 2, 4, and 8, using strips as area models.

Select fraction strip that represents given fraction.

- A** ratio of non-shaded to shaded
- B** ratio of shaded to non-shaded
- C** incorrect shading
- D** correct

- 17 N.MR.03.09:** Use multiplication and division fact families to understand the inverse relationship of these two operations, e.g., because  $3 \times 8 = 24$ , we know that 24 divided by  $8 = 3$  or 24 divided by  $3 = 8$ ; express a multiplication statement as an equivalent division statement.

Complete multiplication/division fact family.

- A** correct
- B** addition/subtraction fact
- C** two unrelated multiplication facts
- D** unrelated multiplication/division fact

- 18 G.GS.03.06:** Identify, describe, build and classify familiar three-dimensional solids, e.g., cube, rectangular prism, sphere, pyramid, cone, based on their component parts (faces, surfaces, bases, edges, vertices).

Identify characteristic that does not describe 3-D shape.

- A correct characteristic
- B correct
- C correct characteristic
- D correct characteristic

- 19 M.TE.03.09:** Estimate the perimeter of a square and rectangle in inches and centimeters; estimate the area of a square and rectangle in square inches and square centimeters.

Estimate perimeter of rectangle in inches.

- A area
- B length + width
- C correct
- D overestimate by 4 inches

- 20 D.RE.03.01:** Read and interpret bar graphs in both horizontal and vertical forms.

Interpret bar graph.

- A incorrect difference
- B correct
- C incorrect difference
- D minuend

- 21 M.UN.03.06:** Use square units in calculating area by covering the region and counting the number of square units.

Determine the area of a shaded rectangle.

- A correct
- B perimeter
- C length + width
- D approximated diagonal

- 22 M.UN.03.05:** Know the definition of area and perimeter and calculate the perimeter of a square and rectangle given whole number side lengths.

Determine perimeter of rectangle given its width and length.

- A length + width
- B length + length
- C correct
- D length x width

- 23 G.GS.03.06:** Identify, describe, build and classify familiar three-dimensional solids, e.g., cube, rectangular prism, sphere, pyramid, cone, based on their component parts (faces, surfaces, bases, edges, vertices).

Identify 3-D shape with given characteristics.

- A** incorrect 3-D shape
- B** correct
- C** incorrect 3-D shape
- D** incorrect 3-D shape

- 24 M.UN.03.06:** Use square units in calculating area by covering the region and counting the number of square units.

Find the area of a shaded triangle in square units on grid.

- A** number of fully shaded square units
- B** correct
- C** counted partially shaded square units as whole
- D** base times height

- 25 M.UN.03.07:** Distinguish between units of length and area, and choose a unit appropriate in the context.

Identify the practical unit of height.

- A** unit of area
- B** unreasonable height
- C** unit of area
- D** correct

- 26 M.UN.03.07:** Distinguish between units of length and area, and choose a unit appropriate in the context.

Identify the unit of length.

- A** unit of time
- B** unit of capacity
- C** unit of mass
- D** correct

- 27 N.ME.03.02:** Identify the place value of a digit in a number, e.g., in 3,241, 2 is in the hundreds place. Recognize and use expanded notation for numbers using place value through 9,999, e.g., 2,517 is  $2000 + 500 + 10 + 7$ ; 4 hundreds and 2 ones is 402.

Translate expanded form of number into standard form.

- A**  $a00 + b0 + c = a00,b0c$
- B**  $a00 + b0 + c = a,b0c$
- C**  $a00 + b0 + c = a,0bc$
- D** correct

- 28 M.UN.03.06:** Use square units in calculating area by covering the region and counting the number of square units.

Find the area of a rectangle in square centimeters.

- A** length
- B** less than correct area
- C** perimeter
- D** correct

- 29 N.MR.03.10:** Recognize situations that can be solved using multiplication and division including finding “How many groups?” and “How many in a group?” and write mathematical statements to represent those situations.

Given a contextualized situation, identify corresponding division number sentence.

- A** multiplication number sentence
- B** correct
- C** subtraction number sentence
- D** addition number sentence

- 30 N.MR.03.10:** Recognize situations that can be solved using multiplication and division including finding “How many groups?” and “How many in a group?” and write mathematical statements to represent those situations.

Multiply (or use repeated addition) in context.

- A** addend
- B** addend
- C** added
- D** correct

- 31 N.FL.03.11:** Find products fluently up to  $10 \times 10$ ; find related quotients using multiplication and division relationships.

Divide 2-digit number by 1-digit number.

- A** added
- B** subtracted
- C** correct
- D** incorrect quotient

- 32 N.FL.03.06:** Add and subtract fluently two numbers through 999 with regrouping and through 9,999 without regrouping.

Subtract with two 3-digit numbers.

- A** incorrect in 1s place
- B** correct
- C** subtracted smaller values from larger values
- D** added in 1s place

- 33 D.RE.03.01:** Read and interpret bar graphs in both horizontal and vertical forms.

Interpret bar graph.

- A** incorrect difference
- B** incorrect difference
- C** correct
- D** minuend

- 34 N.ME.03.16:** Understand that fractions may represent a portion of a whole unit that has been partitioned into parts of equal area or length; use the terms “numerator” and “denominator.”

Identify fraction with given numerator.

- A** numerator + denominator = numerator
- B** correct
- C** fraction with numerator 10 more than given numerator
- D** denominator

- 35 N.ME.03.17:** Recognize, name, and use equivalent fractions with denominators 2, 4, and 8, using strips as area models.

Given the fraction, identify the strip that shows the equivalent fraction.

- A** nonequivalent fraction model
- B** nonequivalent fraction model
- C** correct
- D** nonequivalent fraction model

- 36 M.UN.03.06:** Use square units in calculating area by covering the region and counting the number of square units.

Find area in square units of triangle on grid.

- A** half of correct area
- B** correct
- C** incorrect area
- D** twice the correct area

- 37 N.ME.03.05:** Know that even numbers end in 0, 2, 4, 6, or 8; name a whole number quantity that can be shared in two equal groups or grouped into pairs with no remainders; recognize even numbers as multiples of 2. Know that odd numbers end in 1, 3, 5, 7, or 9. Work with patterns involving even and odd numbers.

Identify even 3-digit number.

- A** odd
- B** correct
- C** odd
- D** odd

- 38 M.UN.03.05:** Know the definition of area and perimeter and calculate the perimeter of a square and rectangle given whole number side lengths.

Identify rectangle with given perimeter.

- A** perimeter = length + width
- B** correct
- C** perimeter = length + width
- D** perimeter = length + width

- 39 N.ME.03.18:** Place fractions with denominators of 2, 4, and 8 on the number line; relate the number line to a ruler; compare and order up to three fractions with denominators 2, 4, and 8.

Locate a fraction on a ruler.

- A** measured from the  $\frac{1}{2}$  tick mark instead of the zero
- B** correct
- C**  $a/b = (a + 1)/(b + 1)$
- D** incorrect use of scale

- 40 N.MR.03.09:** Use multiplication and division fact families to understand the inverse relationship of these two operations, e.g., because  $3 \times 8 = 24$ , we know that 24 divided by  $8 = 3$  or 24 divided by  $3 = 8$ ; express a multiplication statement as an equivalent division statement.

Identify 4th member of multiplication/division fact family.

- A** addition fact
- B** correct
- C** unrelated multiplication fact
- D** unrelated multiplication fact

- 41 G.GS.03.06:** Identify, describe, build and classify familiar three-dimensional solids, e.g., cube, rectangular prism, sphere, pyramid, cone, based on their component parts (faces, surfaces, bases, edges, vertices).

Identify total number of faces on 3-D shape.

- A** fewer than total number of faces
- B** correct
- C** greater than total number of faces
- D** greater than total number of faces

- 42 M.PS.03.10:** Add and subtract lengths, weights, and times using mixed units, within the same measurement system.

Calculate elapsed time.

- A** under by 10 minutes
- B** correct
- C** over by 1 hour
- D** subtracted smaller values from larger values

- 43 M.PS.03.10:** Add and subtract lengths, weights, and times using mixed units, within the same measurement system.

Subtract lengths in inches and feet.

- A** added
- B** minuend
- C** correct number of feet, incorrect number of inches
- D** correct

- 44 M.PS.03.13:** Solve contextual problems about perimeters of rectangles and areas of rectangular regions.

Calculate perimeter in context given length and width.

- A** length + width
- B** correct
- C**  $(\text{length} \times \text{width}) \div 10$
- D** length  $\times$  width

- 45 D.RE.03.03:** Solve problems using information in bar graphs, including comparison of bar graphs.

Interpret bar graphs.

- A** incorrect difference
- B** incorrect difference
- C** correct
- D** incorrect difference

- 46 M.UN.03.02:** Measure in mixed units within the same measurement system for length, weight, and time: feet and inches, meters and centimeters, kilograms and grams, pounds and ounces, liters and milliliters, hours and minutes, minutes and seconds, years and months.

Calculate elapsed time using two radial clocks.

- A** correct
- B** 15 minutes over
- C** 25 minutes over
- D** 45 minutes over

- 47 M.UN.03.01:** Know and use common units of measurements in length, weight, and time.

Identify the unit of length.

- A** unit of mass
- B** correct
- C** unit of capacity
- D** unit of weight

- 48 M.UN.03.01:** Know and use common units of measurements in length, weight, and time.

Identify unit of mass.

- A** standard unit of length
- B** correct
- C** standard unit of length
- D** metric unit of length

- 49 D.RE.03.03:** Solve problems using information in bar graphs, including comparison of bar graphs.

Interpret data in horizontal bar graph.

- A** correct
- B** minimum, not difference between two categories
- C** range
- D** maximum

- 50 M.UN.03.03:** Understand relationships between sizes of standard units, e.g., feet and inches, meters and centimeters.

Identify shortest distance.

- A** neither shortest nor longest distance
- B** neither shortest nor longest distance
- C** longest distance
- D** correct

- 51 M.PS.03.10:** Add and subtract lengths, weights, and times using mixed units, within the same measurement system.

Add with inches in context.

- A** incorrect difference
- B** subtracted
- C** correct
- D** 1 foot = 10 inches

- 52 M.UN.03.05:** Know the definition of area and perimeter and calculate the perimeter of a square and rectangle given whole number side lengths.

Calculate perimeter of square given side length.

- A** length of 2 sides
- B** correct
- C** length of 8 sides
- D** area

- 53 M.PS.03.12:** Solve applied problems involving money, length, and time.

Calculate elapsed time.

- A** subtracted instead of added
- B** added minutes but not hours
- C** added hours but not minutes
- D** correct

- 54 N.MR.03.15:** Given problems that use any one of the four operations with appropriate numbers, represent with objects, words, (including “product” and “quotient”), and mathematical statements; solve.

Identify division as way to solve a contextualized problem.

- A** addition
- B** subtraction
- C** multiplication
- D** correct

- 55 N.MR.03.15:** Given problems that use any one of the four operations with appropriate numbers, represent with objects, words, (including “product” and “quotient”), and mathematical statements; solve.

Divided in context.

- A** incorrect day
- B** correct
- C** incorrect day
- D** incorrect day

- 56 N.MR.03.15:** Given problems that use any one of the four operations with appropriate numbers, represent with objects, words, (including “product” and “quotient”), and mathematical statements; solve.

Select division equation to represent context of equal sharing.

- A** correct
- B** subtraction equation
- C** addition equation
- D** multiplication equation

- 57 N.MR.03.15:** Given problems that use any one of the four operations with appropriate numbers, represent with objects, words, (including “product” and “quotient”), and mathematical statements; solve.

Divide (or use repeated subtraction) in context.

- A** correct
- B** incorrect quotient
- C** incorrect quotient
- D** dividend minus divisor

- 58 M.UN.03.05:** Know the definition of area and perimeter and calculate the perimeter of a square and rectangle given whole number side lengths.

Determine the perimeter of a rectangle, given its side lengths.

- A** length + width
- B** correct
- C** area
- D** twice the area

**59 M.PS.03.12:** Solve applied problems involving money, length, and time.

Add measurements in feet and inches in context.

- A** subtracted inches but not feet
- B** incorrect difference
- C** correct
- D** over by 1 inch





4th

5th

6th

7th

8th



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