4th

5th

6th

7th

8th

Grade 8

meap™

Michigan Educational Assessment Program

Item Descriptors

MATHEMATICS

FALL 2013

MICHIGAN STATE BOARD OF EDUCATION
STATEMENT OF ASSURANCE OF COMPLIANCE WITH FEDERAL LAW

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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.

Portions of this work were previously published.

Printed in the United States of America.

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.FL.07.07:** Solve problems involving operations with integers.

Subtract integers in context.

A a - (-b) = a + (-b)

B a - (-b) = a

C a - (-b) = a + (b/2)

D correct

2 **N.FL.07.07:** Solve problems involving operations with integers.

Add and subtract with integers to determine temperature.

A -a + b - c = -a - b + c

B correct

C -a + b - c = a - b - c

D -a + b - c = -a - b - c

3 **N.FL.07.08:** Add, subtract, multiply, and divide positive and negative rational numbers fluently.

Divide with negative fractions.

A correct

B multiplied instead of divided

C additive inverse of product

D additive inverse

4 **N.FL.07.08:** Add, subtract, multiply, and divide positive and negative rational numbers fluently.

Subtract negative integers from negative integer.

A -a - (-b) = -a + (-b)

B -a - (-b) = a + (-b)

C correct

D -a - (-b) = a + (b)

5 **N.FL.07.08:** Add, subtract, multiply, and divide positive and negative rational numbers fluently.

Subtract with rational numbers.

A additive inverse of subtracting numerators and denominators

B additive inverse

C correct

D subtracted numerators and denominators

6 **N.FL.07.09:** Estimate results of computations with rational numbers.

Estimate product of two rational numbers.

A underestimate

B correct

C overestimate

D overestimate

7 **A.PA.07.11:** Understand and use basic properties of real numbers: additive and multiplicative identities, additive and multiplicative inverses, commutativity, associativity, and the distributive property of multiplication over addition.

Use distributive property to find equivalent expression.

A $a(bx + c) = bx + ac$

B $a(bx + c) = (ab)x + c$

C correct

D $a(bx + c) = (ab)(xc)$

8 **A.RP.07.02:** Represent directly proportional and linear relationships using verbal descriptions, tables, graphs, and formulas, and translate among these representations.

Translate text into directly proportionally equation.

A linear relationship but not directly proportional

B inversely proportional relationship

C correct

D linear relationship but not directly proportional

9 **A.PA.07.11:** Understand and use basic properties of real numbers: additive and multiplicative identities, additive and multiplicative inverses, commutativity, associativity, and the distributive property of multiplication over addition.

Solve linear equation.

A half of correct value

B correct

C difference between constants

D constant

10 **A.PA.07.11:** Understand and use basic properties of real numbers: additive and multiplicative identities, additive and multiplicative inverses, commutativity, associativity, and the distributive property of multiplication over addition.

Identify property of real numbers.

A incorrect property

B incorrect property

C correct

D incorrect property

11 **A.RP.07.02:** Represent directly proportional and linear relationships using verbal descriptions, tables, graphs, and formulas, and translate among these representations.

Match given table to linear equation.

A additive inverse of slope

B correct equation for only one pair of variables

C correct

D correct equation for only first pair of variables

12 **A.RP.07.02:** Represent directly proportional and linear relationships using verbal descriptions, tables, graphs, and formulas, and translate among these representations.

Match given table to linear equation.

A twice the correct slope

B correct

C additive inverse of correct slope

D twice the additive inverse of correct slope, additive inverse of correct y-intercept

13 **A.RP.07.02:** Represent directly proportional and linear relationships using verbal descriptions, tables, graphs, and formulas, and translate among these representations.

Match context of rate and distance to equation.

A $d = at$ is equal to $d = t/a$

B $d = at$ is equal to $d = a + t$

C $d = at$ is equal to $d = a/t$

D correct

14 **A.PA.07.11:** Understand and use basic properties of real numbers: additive and multiplicative identities, additive and multiplicative inverses, commutativity, associativity, and the distributive property of multiplication over addition.

Identify commutative property of addition.

A incorrect property

B incorrect property

C incorrect property

D correct

15 **A.FO.07.12:** Add, subtract, and multiply simple algebraic expressions of the first degree. e.g., (92x + 8y) - 5x + y, or x(x + 2), and justify using properties of real numbers.

Multiply positive integer by linear expression.

A a(bx + c) = a(b + c)x

B a(bx + c) = (a + b)x + (a + c)

C a(bx + c) = (ab)x + c

D correct

16 **G.TR.07.03:** Understand that in similar polygons, corresponding angles are congruent and the ratios of corresponding sides are equal; understand the concepts of similar figures and scale factor.

Calculate side length of regular octagon given ratio of sides lengths to similar octagon.

A used reciprocal of ratio

B given side length

C added ratio to given side length

D correct

17 **A.FO.07.13:** From applied situations, generate and solve linear equations of the form ax + b = c and ax + b = cx + d, and interpret solutions.

Match context of renting greatest number of video games to equation.

A ax + b = c equals bx + a = c

B correct

C ax + b = c equals bx + c = a

D ax + b = c equals ax + c = b

18 **A.FO.07.12:** Add, subtract, and multiply simple algebraic expressions of the first degree. e.g., (92x + 8y) - 5x + y, or x(x + 2), and justify using properties of real numbers.

Simplify linear expression.

A correct

B a - (bx + c) + dx = (c + d)x + (a - b)

C a - (bx + c) + dx = (b + d)x + (a + c)

D a - (bx + c) + dx = (d - b)x + (a + c)

19 **A.PA.07.04:** For directly proportional or linear situations, solve applied problems using graphs and equations; e.g., the heights and volume of a container with uniform cross-section; height of water in a tank being filled at a constant rate; degrees Celsius and degrees Fahrenheit; distance and time under constant speed.

Solve applied directly proportional equation to find missing height.

A correct

B subtracted given height from greater time

C added given height to difference of times

D added first two numbers given (height + time)

20 **A.FO.07.12:** Add, subtract, and multiply simple algebraic expressions of the first degree. e.g., (92x + 8y) - 5x + y, or x(x + 2), and justify using properties of real numbers.

Subtract linear expression from positive integer.

A a - (bx - c) = -bx + a - c

B a - (bx - c) = bx + a - c

C correct

D a - (bx - c) = -bx - a - c

21 **A.PA.07.04:** For directly proportional or linear situations, solve applied problems using graphs and equations; e.g., the heights and volume of a container with uniform cross-section; height of water in a tank being filled at a constant rate; degrees Celsius and degrees Fahrenheit; distance and time under constant speed.

Calculate number of gallons needed to fill pool to given depth.

A number of gallons given in stem

B correct

C twice the amount given in stem, used incorrect ratio

D three times amount given in stem, used incorrect ratio

22 **A.PA.07.04:** For directly proportional or linear situations, solve applied problems using graphs and equations; e.g., the heights and volume of a container with uniform cross-section; height of water in a tank being filled at a constant rate; degrees Celsius and degrees Fahrenheit; distance and time under constant speed.

Translate from degrees Fahrenheit to degrees Celsius.

A incorrect conversion

B correct

C incorrect conversion

D incorrect conversion

23 **A.PA.07.05:** Recognize and use directly proportional relationships of the form y = mx, and distinguish from linear relationships of the form y = mx + b, b non-zero; understand that in a directly proportional relationship between two quantities one quantity is a constant multiple of the other quantity.

Identify directly proportional relationship in context of downloading music.

A directly proportional to number of months instead of number of downloads

B linear rate

C correct

D linear rate

24 **A.PA.07.05:** Recognize and use directly proportional relationships of the form y = mx, and distinguish from linear relationships of the form y = mx + b, b non-zero; understand that in a directly proportional relationship between two quantities one quantity is a constant multiple of the other quantity.

Identify linear relationship that is not a direct proportion.

A directly proportional

B directly proportional

C correct

D directly proportional

25 **A.PA.07.04:** For directly proportional or linear situations, solve applied problems using graphs and equations; e.g., the heights and volume of a container with uniform cross-section; height of water in a tank being filled at a constant rate; degrees Celsius and degrees Fahrenheit; distance and time under constant speed.

Interpret distance-time line graph.

A less than correct distance

B correct

C greater than correct distance

D greater than correct distance

26 **A.PA.07.11:** Understand and use basic properties of real numbers: additive and multiplicative identities, additive and multiplicative inverses, commutativity, associativity, and the distributive property of multiplication over addition.

Identify that the distributive property was shown.

A incorrect property

B correct

C incorrect property

D incorrect property

27 **A.PA.07.11:** Understand and use basic properties of real numbers: additive and multiplicative identities, additive and multiplicative inverses, commutativity, associativity, and the distributive property of multiplication over addition.

Solve linear equation.

A twice the additive inverse

B additive inverse

C incorrect solution

D correct

28 **D.AN.07.04:** Find and interpret the median, quartiles, and interquartile range of a given set of data.

Find the median of a data set.

A first quartile

B mean

C correct

D mean of the middle two values

29 **D.AN.07.04:** Find and interpret the median, quartiles, and interquartile range of a given set of data.

Determine the median of list of numbers.

A minimum

B correct

C mode

D maximum

30 **D.AN.07.04:** Find and interpret the median, quartiles, and interquartile range of a given set of data.

Identify median in box-and-whisker plot.

A minimum

B first quartile

C correct

D third quartile

31 **N.MR.07.04:** Convert ratio quantities between different systems of units, such as feet per second to miles per hour.

Estimate conversion from feet per second to miles per hour.

A incorrect conversion factor

B correct

C feet/sec × 5280/3600

D feet/sec × 5280/3600, then rounded up

32 **D.RE.07.01:** Represent and interpret data using circle graphs, stem and leaf plots, histograms, and box-and-whisker plots, and select appropriate representation to address specific questions.

Interpret circle graph to determine the total number of students that do not have a cat or dog.

A percentage of students that do not have a dog or cat

B percentage of students that have a dog or cat

C correct

D number of students that have a dog or cat

33 **D.RE.07.01:** Represent and interpret data using circle graphs, stem and leaf plots, histograms, and box-and-whisker plots, and select appropriate representation to address specific questions.

Identify histogram as best way to display data given in intervals.

A incorrect type of representation

B incorrect type of representation

C correct

D incorrect type of representation

34 **D.RE.07.01:** Represent and interpret data using circle graphs, stem and leaf plots, histograms, and box-and-whisker plots, and select appropriate representation to address specific questions.

Compute with percentages in context.

A half of correct amount

B correct

C twice the correct amount

D four times the correct amount

35 **N.FL.07.05:** Solve proportion problems using such methods as unit rate, scaling, finding equivalent fractions, and solving the proportion equation a/b = c/d; know how to see patterns about proportional situations in tables.

Calculate the unit rate in order to determine the total cost of several apples.

A used reciprocal of unit rate

B unit rate + number of apples

C correct

D total number of apples × number of apples used to find unit rate

36 **G.TR.07.03:** Understand that in similar polygons, corresponding angles are congruent and the ratios of corresponding sides are equal; understand the concepts of similar figures and scale factor.

Determine change in perimeter of rectangle when dimensions are multiplied by scale factor.

A correct

B perimeter is multiplied by twice the scale factor

C perimeter is multiplied by three time the scale factor

D perimeter is multiplied by the square of the scale factor

37 **G.TR.07.04:** Solve problems about similar figures and scale drawings.

Given scale factor of map and distance on map, calculate actual distance.

A multiplied numbers in scale factor

B correct

C multiplied distance on map times distance in scale factor, then subtracted distance in scale factor

D multiplied distance on map times distance in scale factor

38 **G.TR.07.04:** Solve problems about similar figures and scale drawings.

Calculate length of car given scale and length of model.

A added two numbers in scale

B used scale incorrectly

C correct

D over by 1 foot

39 **G.TR.07.04:** Solve problems about similar figures and scale drawings.

Calculate actual height of door given the scale, width and height of the drawing.

A used the scale as the measurement

B width of the door

C correct

D twice the height

40 **G.TR.07.06:** Understand and use the fact that when two triangles are similar with scale factor of r, their areas are related by a factor of r^2.

Given the scale factor, find the area of second rectangle.

A area of first rectangle

B used scale factor of r

C used scale factor of 2r

D correct

41 **G.TR.07.04:** Solve problems about similar figures and scale drawings.

Use scale and measurements to determine size of drawing of classroom.

A inconsistent, incorrect scale

B correct

C 1 cm = 1 foot

D x cm = y feet equals y cm = x feet

42 **G.TR.07.04:** Solve problems about similar figures and scale drawings.

Given scale factor and actual length, calculate length of model.

A changed length in meters in scale factor to centimeters

B correct

C subtracted length in scale in meters from actual length in meters, then changed to centimeters

D changed actual length in meters to centimeters

43 **A.FO.07.12:** Add, subtract, and multiply simple algebraic expressions of the first degree. e.g., (92x + 8y) - 5x + y, or x(x + 2), and justify using properties of real numbers.

Multiply positive integer by linear expression.

A correct

B a(bx - cy) = (ab)x - cy

C a(bx - cy) = (ab - c)xy

D a(bx - cy) = axy

44 **N.FL.07.03:** Calculate rates of change including speed.

Find distance given rate and time.

A correct

B subtracted rate from time

C rate = miles

D added rate and time

45 **N.FL.07.03:** Calculate rates of change including speed.

Calculate the average rate of change of the water level of a lake.

A correct

B over by factor of 10

C subtracted the two levels, but did not divide by the number of years

D added the two water levels instead of subtracted

46 **N.FL.07.05:** Solve proportion problems using such methods as unit rate, scaling, finding equivalent fractions, and solving the proportion equation a/b = c/d; know how to see patterns about proportional situations in tables.

Calculate unit rate to determine cost of several books.

A unit rate

B used $1 as unit rate

C unit rate × unit rate number of books

D correct

47 **D.RE.07.01:** Represent and interpret data using circle graphs, stem and leaf plots, histograms, and box-and-whisker plots, and select appropriate representation to address specific questions.

Interpret a circle graph to determine portion of total.

A 1% = 0.001

B percent given in graph

C correct

D incorrect category

48 **N.MR.07.04:** Convert ratio quantities between different systems of units, such as feet per second to miles per hour.

Convert miles per hour to feet per second.

A yards per second

B mph × 3,600/5,250

C correct

D feet per minute

49 **D.AN.07.04:** Find and interpret the median, quartiles, and interquartile range of a given set of data.

Find the median of a given set of data.

A mode

B correct

C mean

D false median (middle number in unordered list)

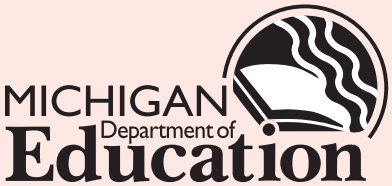
4th

5th

6th

7th

8th



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