NORTH CAROLINA DEPARTMENT OF PUBLIC INSTRUCTION

Pre-Formatted Reports: Benchmark Test Item Analysis - New Format

Data Selections

Institution(s): Middle School,All Schools
Benchmark Administration: 03/24/15, 2014-15 BA2 8th Math Calculator Active
Trend Profile: 2014-2015
Subject: Mathematics
Test Focus: All Test Focuses
Test Level: 08
Test Category: District Benchmark
Grade: 08
Enrollment: Current

Number of questions: 30
Number of test-taking students: 1112

Student Responses

Question - Type	Correct		Incorrect	Most Common Mistake		Point Value	Points Achieved / Possible	P-Value/ Item Mean	Discrimination
	Rate	Value	Total Rate	Rate	Value				
1 - Multiple Choice	27%	C	73%	37%	D	1	303 / 1112	0.27	0.38
2 - Multiple Choice	30%	C	70%	36%	A	1	330 / 1112	0.30	0.37
3 - Multiple Choice	62%	B	38%	27%	C	1	693 / 1112	0.62	0.38
4 - Multiple Choice	39%	D	61%	26%	C	1	437 / 1112	0.39	0.44
5 - Multiple Choice	55%	C	45%	21%	A	1	609 / 1112	0.54	0.41
6 - Multiple Choice	29%	D	71%	35%	A	1	327 / 1112	0.29	0.54
7 - Multiple Choice	57%	B	43%	18%	A	1	633 / 1112	0.57	0.43
8 - Multiple Choice	54%	A	46%	34%	B	1	601 / 1112	0.54	0.23
9 - Multiple Choice	47%	B	53%	23%	C	1	520 / 1112	0.47	0.45
10 - Multiple Choice	36%	D	64%	25%	A	1	401 / 1112	0.36	0.42
11 - Multiple Choice	40%	A	60%	36%	B	1	444 / 1112	0.40	0.38
12 - Multiple Choice	64%	D	36%	14%	A	1	709 / 1112	0.63	0.56
13 - Multiple Choice	56%	B	44%	18%	D	1	621 / 1112	0.56	0.41
14 - Multiple Choice	41%	D	59%	22%	B	1	460 / 1112	0.41	0.43
15 - Multiple Choice	74%	C	26%	10%	B	1	818 / 1112	0.73	0.42
16 - Multiple Choice	28%	C	72%	37%	B	1	309 / 1112	0.28	0.36
17 - Multiple Choice	28%	B	72%	31%	D	1	306 / 1112	0.27	0.18
18 - Multiple Choice	41%	B	59%	28%	C	1	461 / 1112	0.42	0.21
19 - Multiple Choice	31%	D	69%	30%	C	1	343 / 1112	0.31	0.35
20 - Multiple Choice	62%	C	38%	24%	A	1	686 / 1112	0.61	0.49

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21 - Multiple Choice	**50%**	A	**50%**	**22%**	B	1	558 / 1112	0.50	0.46
22 - Multiple Choice	**51%**	D	**49%**	**18%**	B	1	569 / 1112	0.51	0.41
23 - Multiple Choice	**54%**	B	**46%**	**21%**	A	1	598 / 1112	0.53	0.35
24 - Multiple Choice	**57%**	D	**43%**	**18%**	A	1	637 / 1112	0.57	0.37
25 - Multiple Choice	**41%**	A	**59%**	**24%**	B	1	456 / 1112	0.41	0.37
26 - Multiple Choice	**20%**	A	**80%**	**40%**	D	1	227 / 1112	0.20	0.26
27 - Multiple Choice	**39%**	C	**61%**	**24%**	B	1	439 / 1112	0.39	0.34
28 - Multiple Choice	**46%**	C	**54%**	**30%**	B	1	506 / 1112	0.45	0.38
29 - Multiple Choice	**30%**	B	**70%**	**35%**	C	1	339 / 1112	0.31	0.19
30 - Multiple Choice	**24%**	C	**76%**	**38%**	B	1	270 / 1112	0.24	0.18
Summary	**44%**		**56%**				**487 / 1112**		

P-value represents an item's difficulty as evaluated by dividing the total number of correct responses by the total number of students tested. P-value is calculated for true/false, multiple choice, gridded or hot spot-single response items.

Item Mean is the average score for student responses to an open response question or to a multi-part question. Item Mean is calculated for inline response, matching or hot spot-multiple selections items.

Discrimination or Item Total Score Correlation is the correlation between the question score and the overall test score and indicates the extent to which success on an item corresponds to success on the test.

Standards Alignment to Common Core State Standards

Question	ID	Standard Description
1 - Multiple Choice	**CCSS.Math.Content.8.G.B.7**	Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.
2 - Multiple Choice	**CCSS.Math.Content.8.G.C.9**	Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.
3 - Multiple Choice	**CCSS.Math.Content.8.F.B.4**	Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.
4 - Multiple Choice	**CCSS.Math.Content.8.EE.B.5**	Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.
5 - Multiple Choice	**CCSS.Math.Content.8.EE.B.5**	Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.
6 - Multiple Choice	**CCSS.Math.Content.8.G.C.9**	Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.
7 - Multiple Choice	**CCSS.Math.Content.8.G.B.6**	Explain a proof of the Pythagorean Theorem and its converse.
8 - Multiple Choice	**CCSS.Math.Content.8.EE.B.5**	Graph proportional relationships, interpreting the unit rate as the slope of

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the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.

9 - Multiple Choice   CCSS.Math.Content.8.EE.C.8a Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously.

10 - Multiple Choice CCSS.Math.Content.8.EE.C.8b Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. For example, $3x + 2y = 5$ and $3x + 2y = 6$ have no solution because $3x + 2y$ cannot simultaneously be 5 and 6.

11 - Multiple Choice CCSS.Math.Content.8.F.B.4 Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.

12 - Multiple Choice CCSS.Math.Content.8.EE.C.7a Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form $x = a$, $a = a$, or $a = b$ results (where a and b are different numbers).

13 - Multiple Choice CCSS.Math.Content.8.EE.C.7b Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.

14 - Multiple Choice CCSS.Math.Content.8.SP.A.2 Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line.

15 - Multiple Choice CCSS.Math.Content.8.EE.A.4 Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.

16 - Multiple Choice CCSS.Math.Content.8.G.B.6 Explain a proof of the Pythagorean Theorem and its converse.

17 - Multiple Choice CCSS.Math.Content.8.G.B.8 Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.

18 - Multiple Choice CCSS.Math.Practice.MP6 Attend to precision.

19 - Multiple Choice CCSS.Math.Content.8.G.B.7 Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.

20 - Multiple Choice CCSS.Math.Content.8.F.B.4 Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.

21 - Multiple Choice CCSS.Math.Content.8.F.B.4 Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.

22 - Multiple Choice CCSS.Math.Content.8.F.A.1 Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output. Function notation is not required in Grade 8.

23 - Multiple Choice **CCSS.Math.Practice.MP2** Reason abstractly and quantitatively.

24 - Multiple Choice **CCSS.Math.Content.8.F.A.1** Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output. Function notation is not required in Grade 8.

25 - Multiple Choice **CCSS.Math.Practice.MP1** Make sense of problems and persevere in solving them.

26 - Multiple Choice **CCSS.Math.Content.8.EE.C.7b** Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.

27 - Multiple Choice **CCSS.Math.Content.8.EE.C.8c** Solve real-world and mathematical problems leading to two linear equations in two variables. For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair.

28 - Multiple Choice **CCSS.Math.Content.8.EE.C.8b** Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. For example, $3x + 2y = 5$ and $3x + 2y = 6$ have no solution because $3x + 2y$ cannot simultaneously be 5 and 6.

29 - Multiple Choice **CCSS.Math.Content.8.G.B.7** Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.

30 - Multiple Choice **CCSS.Math.Content.8.F.B.5** Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.

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