Georgia

End-

Of-

Course

Tests

Coordinate Algebra

Released Items Commentary

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"Making Education Work for All Georgians"

About This Document

This document is designed to accompany the booklet of released items for the Coordinate Algebra End of Course Test (EOCT).

For each item the following information is provided:

- Framework Unit in which the standard being assessed is introduced
- EOCT Domain
- Standard Alignment
- Depth of Knowledge (DOK)
- Key
- Student Performance:
    - P-value is a measure of item difficulty and represents the percentage of test takers who answered the item correctly. For example, a p-value of 0.398 indicates that 39.8 percent of the students answered the item correctly.
    - Percent of students choosing each option or omitting the item is also shown. For example, if the value of 15.61 is shown for Percent B, this means that 15.61 percent of the students chose option B as their answer.
- Commentary is provided to explain what is expected of the students and what each incorrect option shows about what the students did not understand about the standard the item is assessing.

ITEM NUMBER	FRAMEWORK UNIT	EOCT DOMAIN	STANDARD ALIGNMENT	DOK	KEY
1	1	Algebra and Functions	A.SSE.01b	1	B

Student Performance *Key denoted by **					
P-Value	**Percent A**	**Percent B***	**Percent C**	**Percent D**	**Percent Omit**
0.364	50.35	36.36	9.38	2.97	0.94

COMMENTARY:
In this item, students must be able to view the decay factor as a single entity and accurately perform the operation required by the formula.

Answer choice A is incorrect because the value *d*, rather than$(1-d)^n$, is interpreted as the decay factor; in other words, the student sets up the formula as \$21,000 X $(1-0.7)^n$ and ignores the *n*. Answer choice C is incorrect because \$21,000 is divided by the decay factor. Answer choice D is incorrect because the student substitutes 0.7 as the value for d, rather than as the value for the expression of $(1-d)^n$ and then adds the 0.7 to 1; in other words, the student sets up the problem as \$21,000 X $(1+0.7)^n$ and ignores the *n*.

ITEM NUMBER	*FRAMEWORK UNIT*	*EOCT DOMAIN*	*STANDARD ALIGNMENT*	*DOK*	*KEY*
2	1	Algebra and Functions	A.SSE.01b	1	B

Student Performance *Key denoted by **					
P-Value	**Percent A**	**Percent B***	**Percent C**	**Percent D**	**Percent Omit**
0.169	9.83	16.88	46.72	26.38	0.19

COMMENTARY:
In this item, students interpret complicated expressions by viewing one or more of their parts as a single entity.

Answer choice A is incorrect because only the expressions in parentheses were identified as factors. Answer choice C is incorrect because the coefficient 4 was identified as the number of factors. Answer choice D is incorrect because each individual term was identified as a factor.

ITEM NUMBER	FRAMEWORK UNIT	EOCT DOMAIN	STANDARD ALIGNMENT	DOK	KEY
3	1	Algebra and Functions	A.CED.01	2	D

Student Performance *Key denoted by **					
P-Value	**Percent A**	**Percent B**	**Percent C**	**Percent D***	**Percent Omit**
0.653	14.12	7.23	11.63	65.29	1.73

COMMENTARY:
In this item, students are asked to create an algebraic equation to represent a real-world problem.

Answer choice A is incorrect because the time required for set up and cleaning is subtracted from the expression that represents the time needed to print *s* shirts. Answer choice B is incorrect because the expression that represents the time needed to print *s* shirts is subtracted from the time required for set up and cleaning. Answer choice C is incorrect because the time required for set up is subtracted from the time required for cleaning, and then the result is added to the time needed to print *s* shirts.

ITEM NUMBER	FRAMEWORK UNIT	EOCT DOMAIN	STANDARD ALIGNMENT	DOK	KEY
4	1	Algebra and Functions	A.CED.02	1	B

Student Performance *Key denoted by **					
P-Value	**Percent A**	**Percent B***	**Percent C**	**Percent D**	**Percent Omit**
0.493	9.71	49.26	11.94	28.91	0.19

COMMENTARY:
In this item, students are asked to recognize an equation which models exponential growth.

Answer choice A is incorrect because it demonstrates exponential decay. Answer choice C is incorrect because $(r - 1)$ is negative for realistic values of the rate. Answer choice D is incorrect because it demonstrates exponential decay for realistic values (i.e., less than 100%) of the rate.

ITEM NUMBER	FRAMEWORK UNIT	EOCT DOMAIN	STANDARD ALIGNMENT	DOK	KEY
5	1	Algebra and Functions	A.SSE.01b	2	A

Student Performance *Key denoted by **					
P-Value	**Percent A***	**Percent B**	**Percent C**	**Percent D**	**Percent Omit**
0.568	56.77	10.78	22.86	9.32	0.26

COMMENTARY:
In this item, students are asked to reason about the structure of an expression and interpret the effect on the expression if a single entity is changed.

Answer choice B is incorrect because 2 is substituted for the value of *z* and multiplied by 16. Answer choice C is incorrect because -2 is substituted for the value of *z*. Answer choice D is incorrect because 2 is substituted for the value of *z*.

ITEM NUMBER	FRAMEWORK UNIT	EOCT DOMAIN	STANDARD ALIGNMENT	DOK	KEY
6	2	Algebra and Functions	A.REI.05	2	D

Student Performance *Key denoted by **					
P-Value	**Percent A**	**Percent B**	**Percent C**	**Percent D***	**Percent Omit**
0.159	24.50	25.35	33.28	15.87	1.00

COMMENTARY:
In this item, students must recognize that when given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.

Answer choice A is incorrect because only the coefficient for *y* has been multiplied by -1 in the second equation. Answer choice B is incorrect because non-corresponding coefficients have been added. Answer choice C is incorrect because there is an inconsistency between the operations performed on the coefficient of *x,* the constant, and the coefficient of *y*.

ITEM NUMBER	FRAMEWORK UNIT	EOCT DOMAIN	STANDARD ALIGNMENT	DOK	KEY
7	2	Algebra and Functions	A.REI.06	2	A

Student Performance *Key denoted by **					
P-Value	**Percent A***	**Percent B**	**Percent C**	**Percent D**	**Percent Omit**
0.427	42.66	12.20	28.99	14.31	1.84

COMMENTARY:
In this item, students are asked to solve a system of linear equations.

Answer choices B and C are incorrect because of calculation errors, in particular when dealing with the signs of the coefficients. Answer choice D could arise from the *y* variable being ignored when the two equations are subtracted as is.

ITEM NUMBER	FRAMEWORK UNIT	EOCT DOMAIN	STANDARD ALIGNMENT	DOK	KEY
8	3	Algebra and Functions	A.REI.10	2	B

Student Performance *Key denoted by **					
P-Value	**Percent A**	**Percent B***	**Percent C**	**Percent D**	**Percent Omit**
0.310	18.53	31.04	21.70	27.95	0.77

COMMENTARY:
In this item, students must understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane.

Answer choice A is incorrect because the choice is not true for the *y*-values which correspond to all positive *x*-values, such as (1, 1). Answer choices C and D are incorrect because the equation has more than one solution for which both the *x*-value and the *y*-value are integers, such as (1, 1) and (4, -1).

ITEM NUMBER	FRAMEWORK UNIT	EOCT DOMAIN	STANDARD ALIGNMENT	DOK	KEY
9	2	Algebra and Functions	A.REI.12	2	D

Student Performance *Key denoted by **					
P-Value	**Percent A**	**Percent B**	**Percent C**	**Percent D***	**Percent Omit**
0.358	14.03	13.23	36.84	35.75	0.15

COMMENTARY:
In this item, students are asked to recognize which graph shows the solutions to the given strict linear inequality.

Answer choices A and B are noticeably incorrect because they include the boundary of the half-plane and therefore are not strict linear inequalities. Answer choice C is incorrect because the half-plane represents the solutions for $x < 3y - 2$.

ITEM NUMBER	FRAMEWORK UNIT	EOCT DOMAIN	STANDARD ALIGNMENT	DOK	KEY
10	3	Algebra and Functions	F.LE.03	2	A

Student Performance *Key denoted by **					
P-Value	**Percent A***	**Percent B**	**Percent C**	**Percent D**	**Percent Omit**
0.217	21.71	23.58	40.16	14.01	0.47

COMMENTARY:
In this item, students are provided with an example of an increasing linear function and an increasing exponential function. In the item, the *y*-intercept of *f*(*x*) is greater than the *y*-intercept of *g*(*x*). Given that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, students should discern that *g*(*x*) will eventually intersect *f*(*x*) at one point.

Answer choice B is incorrect because an increasing exponential function will intersect the linear function at only one point. Answer choice C is incorrect because the relationship for all values of *f*(*x*) and *g*(*x*) is based on the visible graphic representation, when in fact *f*(*x*) and *g*(*x*) will eventually intersect. Answer choice D is incorrect as demonstrated by the visible graphic representation of *f*(*x*) and *g*(*x*).

ITEM NUMBER	FRAMEWORK UNIT	EOCT DOMAIN	STANDARD ALIGNMENT	DOK	KEY
11	3	Algebra and Functions	F.IF.09	2	C

Student Performance *Key denoted by **					
P-Value	**Percent A**	**Percent B**	**Percent C***	**Percent D**	**Percent Omit**
0.394	15.50	23.10	39.38	21.40	0.62

COMMENTARY:
In this item, students must compare the slopes of linear functions using different representations. Students must calculate the slopes of the given functions and make comparisons.

Answer choice A is incorrect because the slope is less than the slope of both functions 1 and 2. Answer choice B is incorrect because it has the same slope as function 1. Answer choice D is incorrect because it has the same slope as function 2.

ITEM NUMBER	FRAMEWORK UNIT	EOCT DOMAIN	STANDARD ALIGNMENT	DOK	KEY
12	3	Algebra and Functions	F.LE.01a	2	A

Student Performance *Key denoted by **					
P-Value	**Percent A***	**Percent B**	**Percent C**	**Percent D**	**Percent Omit**
0.515	51.51	22.55	12.97	12.51	0.46

COMMENTARY:
In this item, students must be able to recognize that exponential functions grow or decay by equal factors over equal intervals.

Answer choices B and C are incorrect because the tables provide data that indicate decay, but not by equal factors. Answer choice D is incorrect because the data reflect a relationship of exponential growth, not exponential decay.

ITEM NUMBER	FRAMEWORK UNIT	EOCT DOMAIN	STANDARD ALIGNMENT	DOK	KEY
13	3	Algebra and Functions	F.BF.01b	2	D

Student Performance *Key denoted by **					
P-Value	**Percent A**	**Percent B**	**Percent C**	**Percent D***	**Percent Omit**
0.209	32.59	12.12	34.05	20.93	0.15

COMMENTARY:
In this item, students must describe the perimeter of a rectangular field as a combination of linear functions.

Answer choices A and B are incorrect due to inaccurate application of the definition of perimeter. Answer choice C is incorrect because *x*, and not *2x*, is added to produce the dimensions of the expanded field. Students missing this item fail to see that the new length is $120m + 2x$ and new width is $100m + 2x$.

ITEM NUMBER	FRAMEWORK UNIT	EOCT DOMAIN	STANDARD ALIGNMENT	DOK	KEY
14	3	Algebra and Functions	A.REI.11	3	B

Student Performance *Key denoted by **					
P-Value	**Percent A**	**Percent B***	**Percent C**	**Percent D**	**Percent Omit**
0.081	18.72	8.09	53.29	19.61	0.30

COMMENTARY:
In this item, students are asked to determine which equation would have at least one common solution with the given equation.

The graph of $y = 2^x$ is an increasing function. The equations in answer choices A and D also represent increasing functions, however the functions will not intersect $y = 2^x$. The equation in answer choice C is of similar form as $y = 2^x$, however its graph will not intersect $y = 2^x$.

ITEM NUMBER	FRAMEWORK UNIT	EOCT DOMAIN	STANDARD ALIGNMENT	DOK	KEY
15	5	Algebra Connections to Geometry	G.CO.05	2	D

Student Performance *Key denoted by **					
P-Value	**Percent A**	**Percent B**	**Percent C**	**Percent D***	**Percent Omit**
0.348	20.29	14.43	30.07	34.80	0.24

COMMENTARY:
In this item, students are asked to specify a sequence of transformations that will result in a specific image.

Choice A is incorrect because the described sequence of transformations does not carry point *V* onto its image $V^{"}$. Choice B is incorrect because the described sequence of transformations does not carry ΔUVW onto its image $\Delta U^{"}V^{"}W^{"}$. Choice C is incorrect because the described sequence of transformations does not carry ΔUVW onto its image $\Delta U^{"}V^{"}W^{"}$.

ITEM NUMBER	FRAMEWORK UNIT	EOCT DOMAIN	STANDARD ALIGNMENT	DOK	KEY
16	6	Algebra Connections to Geometry	G.GPE.06	2	D

Student Performance *Key denoted by **					
P-Value	**Percent A**	**Percent B**	**Percent C**	**Percent D***	**Percent Omit**
0.216	27.19	38.86	11.91	21.64	0.40

COMMENTARY:
In this item, students are asked to identify the coordinates of a point between two points that partitions the segment in a given ratio.

Answer choice A is incorrect due to calculation error of the *x* and *y* coordinates of point *P*. Answer choice B is incorrect due to calculation error of the *x*-coordinate of point *P*. Answer choice C is incorrect due to calculation error of the *y*-coordinate of point *P*.

ITEM NUMBER	FRAMEWORK UNIT	EOCT DOMAIN	STANDARD ALIGNMENT	DOK	KEY
17	6	Algebra Connections to Geometry	G.GPE.07	2	C

Student Performance *Key denoted by **					
P-Value	**Percent A**	**Percent B**	**Percent C***	**Percent D**	**Percent Omit**
0.488	13.67	26.95	48.80	9.96	0.62

COMMENTARY:
In this item, students must use coordinates to determine the perimeter of a square.

Answer choice A is incorrect because it is the length of only one side of the square. Answer choice B is incorrect because of a calculation error. Answer choice D is incorrect because it is the area of the square, not the perimeter.

ITEM NUMBER	FRAMEWORK UNIT	EOCT DOMAIN	STANDARD ALIGNMENT	DOK	KEY
18	6	Algebra Connections to Geometry	G.GPE.04	2	C

Student Performance *Key denoted by **					
P-Value	**Percent A**	**Percent B**	**Percent C***	**Percent D**	**Percent Omit**
0.319	24.19	35.43	31.86	7.29	1.24

COMMENTARY:
In this item, students must use coordinates to show that translations move all points in a translated figure.

Answer choice A is incorrect because differences are not squared when calculating the distance from *N* to *N'*. Answer choices B and D are incorrect because of calculation errors.

ITEM NUMBER	FRAMEWORK UNIT	EOCT DOMAIN	STANDARD ALIGNMENT	DOK	KEY
19	4	Algebra Connections to Statistics & Probability	S.ID.06a	2	B

Student Performance					
P-Value	**Percent A**	**Percent B***	**Percent C**	**Percent D**	**Percent Omit**
0.408	33.06	40.81	15.88	9.93	0.33

COMMENTARY:
In this item, students must use a linear regression model to estimate the time required to travel a given distance.

Answer choice A is incorrect because the estimation was visually based upon the graph without consideration of the broken axis, rather than utilizing the regression function. Answer choices C and D are incorrect because the estimation is visually based upon an incorrect interpretation of the graph, rather than utilizing the regression function.

ITEM NUMBER	FRAMEWORK UNIT	EOCT DOMAIN	STANDARD ALIGNMENT	DOK	KEY
20	4	Algebra Connections to Statistics & Probability	S.ID.08	1	A

Student Performance					
P-Value	**Percent A***	**Percent B**	**Percent C**	**Percent D**	**Percent Omit**
0.216	21.55	41.32	27.44	8.84	0.85

COMMENTARY:
In this item, students are asked to interpret the correlation coefficient of a linear fit for the scatter plot.

Answer choice B is incorrect because slope is confused with correlation coefficient. Answer choices C and D are incorrect because they represent a positive relationship whereas the graph shows a negative relationship.