K-16 Education Center
Continuing & Innovative Education

Algebra 2A

Examination for Acceleration/Credit By Exam Study Guide

This Credit By Exam Study Guide can help you prepare for the exam by giving you an idea of what you need to study, review, and learn. To succeed, you should be thoroughly familiar with the subject matter before you attempt to take the exam.

Every question that appears on the Credit by Exam/Examination for Acceleration is grounded in the knowledge and skills statements and student expectations within the state-mandated standards, the Texas Essential Knowledge and Skills (TEKS). It should be noted that an exam will not test every student expectation. However, it is important that students study and know the entire scope of the TEKS so that they can develop a complete understanding of the content. The CBE/EAs are a global exam grounded in the TEKS and are not designed to be a final exam for the University of Texas high school courses. You can view the TEKS for this exam online at http://www.tea.state.tx.us/teks/. Since questions are not taken from any one source, you can prepare by reviewing any of the state-adopted textbooks.

About the exam

The Credit By Exam consists of 40 multiple-choice questions that are equally weighted. You will be allowed **3 hours** to take the exam and you will be allowed to use a **graphing calculator**.

Materials Provided

For paper-based exams, a formula sheet will be provided with your test. For computer-based exams, the proctor will provide to you a paper copy of the formula sheet immediately prior to testing. You will return the sheet after the exam. The following information will be on the formula sheet.

Matrix Addition: add the corresponding elements

Matrix Subtraction: subtract the corresponding elements

Matrix Multiplication: multiply the elements in the rows of the first matrix times the elements in the columns of the second matrix.

Slope of a line: $m = \dfrac{y_2 - y_1}{x_2 - x_1}$

Slope-Intercept Form of an Equation: $y = mx + b$

Concepts and Objectives

The bulleted list and sample questions below may not refer to all the material that will be in the exam. This list only provides additional information for some of the student expectations tested in the Algebra 2 First Semester Credit by Exam. The use of problem-solving skills is important; all problem-solving activities require more than one step. In addition, you may be asked to use algebra and arithmetic skills from previous math courses. To prepare for this exam, refer to the Texas Essential Knowledge and Skills for Algebra 1, Geometry, and Algebra 2.

Ultimately, you should use the TEKS to guide your exam preparation.

In Algebra 2A, you learned about the foundations of functions, including translations, dilations, and transformations. You also learned about linear equations, linear inequalities, systems of linear equations, matrices, quadratic equations, square root equations, and complex numbers. On the exam, you should be able to
  • identify linear, quadratic, or exponential functions given words that describe a problem situation, a table, a graph, or a function rule
  • use words to describe linear, quadratic, or exponential functions given a table, a graph, or a function rule
  • use the definition of slope to identify linear relationships
  • make a table of values for linear, quadratic, or exponential function rules given words that describe a problem situation, a graph, or a function rule
  • graph linear, quadratic, or exponential function rules given words that describe a problem situation, a table, or a function rule
  • write linear, quadratic, or exponential function rules given words that describe a problem situation, a table, or a graph
  • describe the domain and range of a linear, quadratic, square root, or exponential function rule
  • describe the meaning of the slope and y-intercept given a problem situation
  • describe how changing the linear, quadratic, or exponential function rule shifts the graph to the left or right and up or down
  • describe how changing the coefficient of the x^2 term impacts the graph of a quadratic function
  • use translations to the find a new coordinate of the y-intercept or the highest point of the graph
  • use translations to identify a new function
  • determine the translation applied to an original function that produced a new function
  • identify function rules that represent a reflection across the x-axis or y-axis
  • describe the meaning of the slope and y-intercept given a problem situation
  • make predictions about data
  • solve linear equations and inequalities using symbolic methods
  • write a system of linear equations given a problem situation
  • graph a system of two or three linear equations or inequalities
  • solve systems of two or three linear equations by graphing, substitution, and elimination methods
  • interpret the meaning of specific points that make a system of equations true
  • add matrices
  • multiply matrices

- write a matrix equation that represents a given problem situation
- show by finite differences that a table of data represents a quadratic function
- write a quadratic function in vertex form
- identify the vertex, axis of symmetry, and the minimum or maximum value of a quadratic function
- describe the meaning of the vertex given a problem situation
- find and graph the inverse function for linear and quadratic functions
- rewrite functions by completing the square
- use the area formula for rectangles to write quadratic function rules and to solve problem situations
- determine the height of an object that is launched straight into the air given the initial height and initial velocity
- solve quadratic equations by using factoring, graphing, completing the square and the quadratic formula
- solve problem situations using the graph of a quadratic function
- solve quadratic inequalities by using graphing and symbolic methods
- solve square root equations by using graphing and symbolic methods
- determine the factors and zeros of an equation given the solutions or the graph
- determine a possible quadratic equation given the zeros
- write a quadratic equation given the zeros and the coefficient of the x^2 term
- write a quadratic equation given the solutions and a point at through which the graph passes
- determine the value of c given the coefficient of the x^2 and x terms and the minimum or maximum value of the quadratic function
- determine the characteristics of the discriminant given a quadratic function rule or graph
- determine if a quadratic equation has one, two, or no solutions
- add, subtract, and multiply complex numbers
- determine the graphs of $f(x) = |x|$, $f(x) = \sqrt{x}$, $f(x) = \dfrac{1}{x}$

Sample Questions

These sample questions will give you a better idea of the types of questions you can expect on the Credit By Exam. These questions are provided to illustrate the format of the exam; they are not a duplicate of the actual exam. In order to be successful on the exam, you must study and review all of the concepts listed above.

Multiple-Choice

This part contains 5 multiple-choice questions. Circle the letter of the correct response to each of the following questions.

1. Solve the following system of equations.

   $2a + 3b + c = -2$
   $a - b + 2c = 9$
   $4a - 4b + 3c = 11$

       A $(-1, -2, 6)$
       B $(-4, 1, 3)$
       C $(-2, -1, 5)$
       D $(2, -3, 3)$

2. What is the new rule if $y = 3x + 6$ is shifted left 4 units and up 3 units?

       A $y = 7x + 9$
       B $y = 3x + 14$
       C $y = 3(x + 4) + 9$
       D $y = 4x + 3$

3. Which table of data represents a linear relationship?

A

x	y
−2	−5
1	4
5	16

C

x	y
4	2
0	0
16	4

B

x	y
2	7
8	67
11	124

D

x	y
−3	3
0	0
4	4

4. What is the result when the two matrices are added together?

$$\begin{bmatrix} 4 & -5 & 2 \\ 3 & -12 & 8 \end{bmatrix} + \begin{bmatrix} -2 & 14 & 9 \\ 8 & -2 & 1 \end{bmatrix}$$

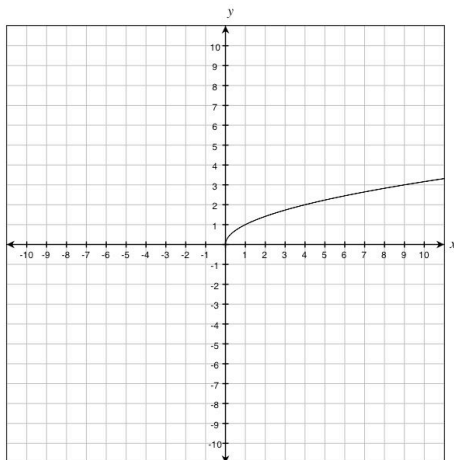A $\begin{bmatrix} 2 & 9 & 11 \\ 11 & -14 & 9 \end{bmatrix}$

B $\begin{bmatrix} 7 & -17 & 10 \\ 6 & 12 & 10 \end{bmatrix}$

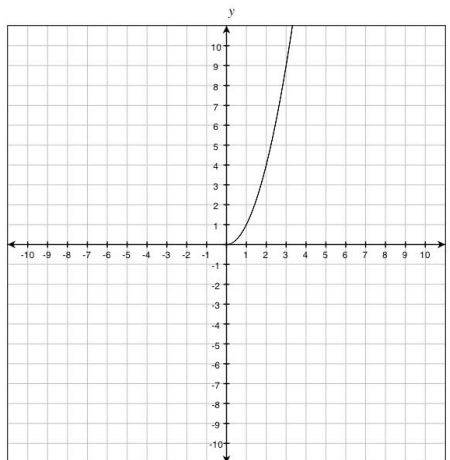C $\begin{bmatrix} 11 & -14 & 9 \\ 2 & 9 & 11 \end{bmatrix}$

D $\begin{bmatrix} 6 & 12 & 10 \\ 7 & -17 & 10 \end{bmatrix}$

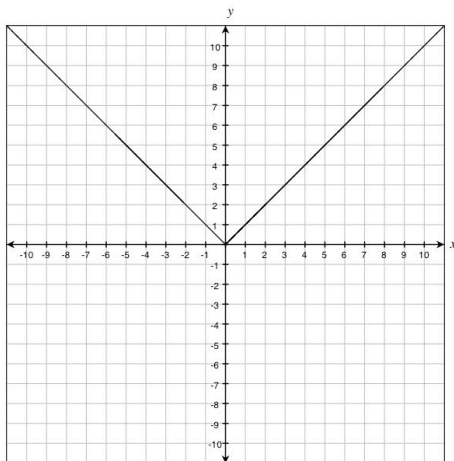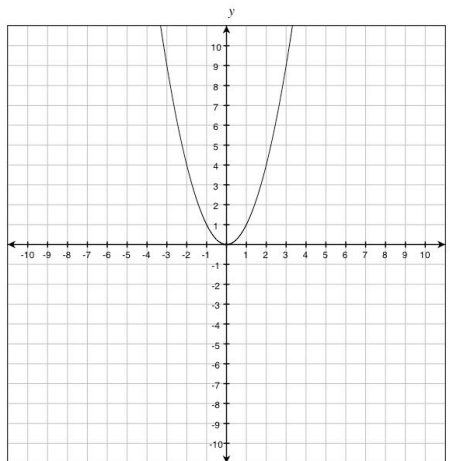5. Which image is the graph of the function $f(x) = \sqrt{x}$?

A

C

B

D

Answer Key

Item Number	Correct Answer	TEKS
1	C	(b)(2A.3)(B)
2	C	(b)(2A.4)(B)
3	A	(b)(2A.1)(B)
4	A	(b)(2A.3)(B)
5	A	(b)(2A.4)(A)