2023–2024 Assessment Guide for Algebra I

This guide includes:

PURPOSE

This document is designed to assist Louisiana educators in understanding the LEAP 2025 mathematics assessment for Algebra I.

Introduction

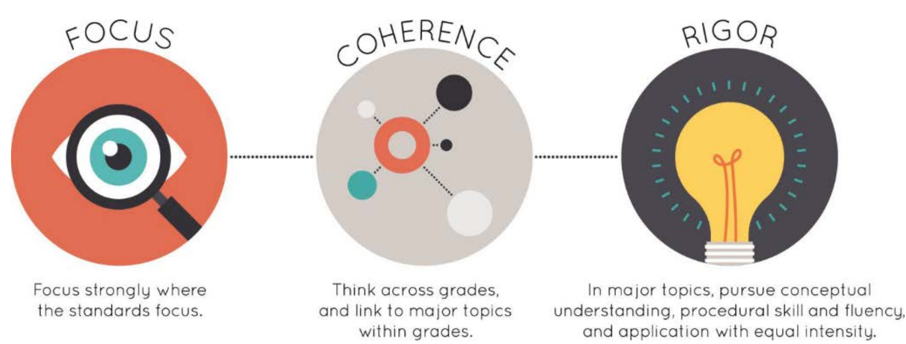
In order to create a more cohesive grades three through high school assessment system, the high school assessments are transitioning from four-level to five-level tests. These new tests provide:

- consistency with the approach and design of the LEAP 2025 mathematics assessments at grades 3-8;
- questions that have been reviewed by Louisiana educators to ensure their alignment with the Louisiana Student Standards for Mathematics (LSSM) and appropriateness for Louisiana students;
- consistency in graduation requirements;
- measurement of the full range of student performance, including the performance of high- and low-performing students; and
- information for educators and parents about student readiness in mathematics and whether students are “on track” for college and careers.

For additional information about the high school assessment program, see the High School Assessment Frequently Asked Questions.

Mathematics Vision for Instruction and Assessment

Students in Louisiana are ready for college or a career if they are able to meet college and workplace expectations without needing remediation in mathematics skills and concepts. The Louisiana Student Standards for Mathematics (LSSM) support students to become mathematically proficient by focusing on three components of rigor: conceptual understanding, procedural skill and fluency, and application.



- **Conceptual understanding** refers to understanding mathematical concepts, operations, and relations. It is more than knowing isolated facts and methods. Students should be able to make sense of why a mathematical idea is important and the kinds of contexts in which it is useful. It also allows students to connect prior knowledge to new ideas and concepts.
- **Procedural Skill and Fluency** is the ability to apply procedures accurately, efficiently, and flexibly. It requires speed and accuracy in calculation while giving students opportunities to practice basic skills. Students' ability to solve more complex application tasks is dependent on procedural skill and fluency.
- **Application** provides a valuable context for learning and the opportunity to solve problems in a relevant and a meaningful way. It is through real-world application that students learn to select an efficient method to find a solution, determine whether the solution(s) makes sense by reasoning, and develop critical thinking skills.

ASSESSMENT DESIGN

Supporting Key Goals in Mathematics Instruction

The LEAP 2025 Mathematics assessments focus on testing the LSSM according to the components of rigor reflected in high-quality mathematics instructional tasks that:

- require students to demonstrate understanding of mathematical reasoning in mathematical and applied contexts;
- assess accurate, efficient, and flexible application of procedures and algorithms;
- rely on application of procedural skill and fluency to solve complex problems; and
- require students to demonstrate mathematical reasoning and modeling in real-world contexts.

Assessable Content

Each item on the LEAP 2025 mathematics assessment is referred to as a task and is identified by one of three types: Type I, Type II, or Type III. The tasks on the LEAP 2025 mathematics assessment are aligned directly to the Louisiana Student Standards for Mathematics (LSSM) for all reporting categories.

- **Type I tasks**, designed to assess conceptual understanding, fluency, and application, are aligned to the major, additional, and supporting content for Algebra I.
- **Type II tasks** are designed to assess student reasoning ability of selected major content for grades 7, 8 or Algebra I in applied contexts.
- **Type III tasks** are designed to assess student modeling ability of selected content for grades 7, 8 or Algebra I in applied contexts. Type II and III tasks are further aligned to LEAP 2025 evidence statements for the Expressing Mathematical Reasoning and Modeling & Application reporting categories.

All tasks are reviewed and vetted by teacher committees to verify direct and full alignment to the LSSM. LEAP 2025 evidence statements for Algebra I are labeled as "LEAP.II.A1.#" for Type II tasks and "LEAP.III.A1.#" for Type III tasks. See the table in Appendix A for a listing of assessable content of the LSSM and LEAP 2025 evidence statements.

As shown in the following table, each of the three task types is aligned to one of four reporting categories: Major Content, Additional & Supporting Content, Expressing Mathematical Reasoning, or Modeling & Application. Each task type is designed to align with at least one of the Louisiana Student Standards for Mathematical Practice (MP), found on pages 6-8 in the K-12 Louisiana Student Standards for Mathematics.

Task Type	Description	Reporting Category	Mathematical Practice (MP)
Type I	conceptual understanding, fluency, and application	**Major Content:** solve problems involving the major content for Algebra I **Additional & Supporting Content:** solve problems involving the additional and supporting content for Algebra I	can involve any or all practices
Type II	written arguments/justifications, critique of reasoning, or precision in mathematical statements	**Expressing Mathematical Reasoning:** express mathematical reasoning by constructing mathematical arguments and critiques	primarily MP.3 and MP.6, but may also involve any of the other practices
Type III	modeling/application in a real-world context or scenario	**Modeling & Application:** solve real-world problems engaging particularly in the modeling practice	primarily MP.4, but may also involve any of the other practices

The Major Content reporting category will be divided, based on Achievement Level Descriptors* into the following subcategories.

Subcategory	Associated LSSM and LEAP 2025 Evidence Statements	Description
Interpreting Functions	A1: F-IF.A.1, A1: F-IF.A.2, A1: F-IF.B.4, A1: F-IF.B.5, LEAP.I.A1.1, LEAP.I.A1.2, LEAP.I.A1.3	Students understand the concept of a function, use function notation, and interpret functions that arise in applications in terms of the context. Students summarize, represent, and interpret statistical data.
Solving Algebraically	A1: A-REI.B.3, A1: A-REI.B.4, A1: A-CED.A.4, LEAP.I.A1.4, LEAP.I.A1.5, LEAP.I.A1.6	Students solve equations and inequalities in one variable, including rearranging formulas for a specific quantity.
Solving Graphically/ Rate of Change	A1: F-IF.B.6, A1: A-CED.A.3, A1: A-REI.D.10, A1: A-REI.D.11, A1: A-REI.D.12	Students represent and solve equations and inequalities graphically. Students calculate and interpret rate of change from various representations.

These reporting categories will provide parents and educators valuable information about

- overall student performance, including readiness to continue further studies in mathematics;
- student performance broken down by mathematics content and practices, which may help identify when students need additional support or more challenging work;
- student performance in Major Content broken down by content subcategories, which may help teachers and schools home in on specific content for professional development; and
- how well schools and school systems are helping students achieve higher expectations.

*Achievement Level Descriptors

Achievement Level Descriptors (ALDs) indicate what a typical student at each level should be able to demonstrate based on his or her command of grade-level standards. In Algebra I, ALDs are written for the four assessment reporting categories. Access the Algebra I ALDs in the Assessment library for a breakdown of the knowledge, skills, and practices associated with each achievement level.

Achievement-Level Definitions

Achievement-level definitions briefly describe the expectations for student performance at each of Louisiana's five achievement levels:

- **Advanced:** Students performing at this level have **exceeded** college and career readiness expectations, and are well prepared for the next level of studies in this content area.
- **Mastery:** Students performing at this level have **met** college and career readiness expectations, and are prepared for the next level of studies in this content area.
- **Basic:** Students performing at this level have **nearly met** college and career readiness expectations, and may need additional support to be fully prepared for the next level of studies in this content area.
- **Approaching Basic:** Students performing at this level have **partially met** college and career readiness expectations, and will need much support to be prepared for the next level of studies in this content area.
- **Unsatisfactory:** Students performing at this level have not yet met the college and career readiness expectations, and will need extensive support to be prepared for the next level of studies in this content area.

Test Design

The LEAP 2025 Algebra I assessment contains a total of 39 tasks for 68 points. The table below shows the breakdown of the number of tasks and point values by Reporting Category and Session. The LEAP 2025 Algebra I test is **timed**. No additional time is permitted, except for students who have a documented extended time accommodation (e.g., an IEP).

Reporting Category	Session 1a: No Calculator		Session 1b: Calculator		Session 2: Calculator		Session 3: Calculator		TOTAL	
	Tasks	Points	Tasks	Points	Tasks	Points	Tasks	Points	Tasks	Points
Major Content	5	5	2	5	7-8	9	7	9	21-22	28
Additional & Supporting Content	2	4	2	2	3-4	4	3	4	10-11	14
Expressing Mathematical Reasoning	0	0	1	3	1	4	1	4	3	11
Modeling & Application	0	0	1	3	1	6	2	6	4	15
TOTAL Operational	7	9	6	13	13	23	13	23	**39**	**68**
Total Embedded Field Test	1	N/A	1	N/A	1	N/A	3	N/A	6	N/A
Session Time	25 minutes		55 minutes		80 minutes		80 minutes		240 minutes	

Note: The test will contain additional field-test tasks. The field-test tasks do **not** count towards a student's final score on the test; they provide information that will be used to help develop future test forms.

The following table includes information on the total tasks, total points, and percentage of assessment points by task-type point-values.

<table>
<tr><th>Task Types</th><th>Point-Values</th><th>Total Tasks</th><th colspan="2">Total Points</th><th colspan="2">Percentage of Assessment Points</th></tr>
<tr><td rowspan="3">Type I</td><td>1-point tasks</td><td>24</td><td>24</td><td rowspan="3">42</td><td>35%</td><td rowspan="3">62%</td></tr>
<tr><td>2-point tasks</td><td>7</td><td>14</td><td>21%</td></tr>
<tr><td>4-point tasks</td><td>1</td><td>4</td><td>6%</td></tr>
<tr><td rowspan="2">Type II</td><td>3-point tasks</td><td>1</td><td>3</td><td rowspan="2">11</td><td>4%</td><td rowspan="2">16%</td></tr>
<tr><td>4-point tasks</td><td>2</td><td>8</td><td>12%</td></tr>
<tr><td rowspan="2">Type III</td><td>3-point tasks</td><td>3</td><td>9</td><td rowspan="2">15</td><td>13%</td><td rowspan="2">22%</td></tr>
<tr><td>6-point tasks</td><td>1</td><td>6</td><td>9%</td></tr>
<tr><td colspan="2">TOTAL</td><td>39</td><td colspan="2">68</td><td colspan="2">100%</td></tr>
</table>

TEST ADMINISTRATION

Administration Information

The LEAP 2025 Algebra I test is administered during three testing windows. The school or district test coordinator will communicate the testing schedule. The table shows the testing window and student-level results by administration.

Administration and Reporting for LEAP 2025 Algebra I

<table>
<tr><th>Administration</th><th>Testing Window</th><th>Release of Results</th></tr>
<tr><td>Fall</td><td>November 27 – December 15</td><td rowspan="3">In window</td></tr>
<tr><td>Spring</td><td>April 15 – May 17</td></tr>
<tr><td>Summer</td><td>June 24 – June 28</td></tr>
</table>

Scheduling Requirements for Computer-Based Testing

Computer-based testing allows school systems some flexibility in scheduling. However, to reduce incidences of testing irregularities, school systems **must adhere** to the following scheduling and administration practices:

- Testing students in the same grade level across the school at or very close to the same time
- Completing makeup testing for students immediately upon their return
- Limiting student interaction during breaks between test sessions
- Isolating students who have not completed testing for the day (e.g., students with extended time accommodation)

- Preventing interaction between groups of students taking the same tests at different times within a testing day
- Requiring the completion of a session once it is opened (i.e., limiting the reopening of test sessions)
- Taking the sessions within a content area in the correct order (e.g., Math Session 1a taken before Math Session 1b)

We also recommend:

- limiting sessions to no more than three in one day for a student; and
- administering **no more than one session** that includes an **extended-response task or writing prompt** (e.g., grades 4-8 Social Studies Session 2, ELA Sessions 1 and 2, English I/II Sessions 1 and 2, and U.S. History Session 2) in a day to an individual student.

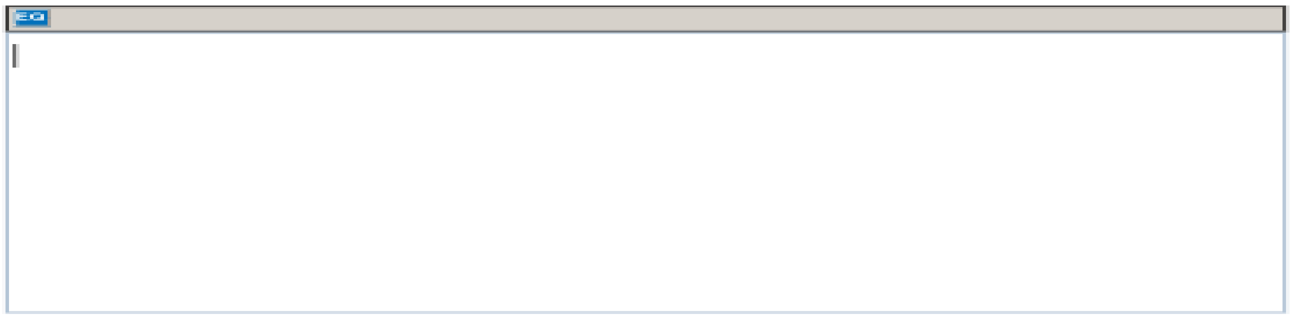
For more information about scheduling and administration policies, refer to the Online Assessment Scheduling Guidance document, found in the LDOE Assessment library.

Item Types

All of the item types in the following list will appear on the tests.

- **Multiple Choice (MC)** – This item type asks students to choose one correct answer from four and may appear as a one-part question, as part of a two-part question, or as a part of a CR item. The MC items are worth one point.
- **Multiple Select (MS) –** This item type asks students to choose **more than one** correct answer and may appear as a one-part question, as part of a two-part question, or as a part of a CR item. Whenever this item type is used, the question always identifies in boldface print that more than one answer is required. The question **may or may not** specify the exact number of correct answers. The MS items are worth one point. Students must choose **all correct answers and no incorrect** answer must be chosen to receive credit.
- **Short Answer (SA) –** This item type asks students to key numeric answers into an entry box using the keyboard and may appear as a one-part question, as part of a two-part question, or as a part of a CR item. The SA items are worth one point. Unless specified in the question, a student will earn credit for an answer that is mathematically equivalent to the correct numerical answer. Answers to SA items can be positive or negative and must be entered in integer or decimal form.
- **Keypad Input (KI) –** This item type asks students to key numeric or algebraic answers in the form of fractions, mixed numbers, expressions, equations, or inequalities. This item type may appear as a one-part question, as part of a two-part question, or as a part of a constructed-response item. The KI items are worth one point. Unless specified in the question, a student will earn credit for an answer that is equivalent to the correct numeric or algebraic response.
- **Technology Enhanced (TE) –** This item type uses technology to capture student responses and may appear as a one-part question, as part of a two-part question, or as a part of a CR item. The TE items are worth one point. Students must meet the requirements of the question exactly to receive credit. The Online Tools Training (OTT) allows students to practice answering the different types of TE questions. For a summary of the different styles of technology-enhanced items, refer to the LEAP 2025 Technology-Enhanced Item Types document.
- **Constructed Response (CR) –** This item type can be single- or multi-part. CR items ask students to create a written explanation or justification, model a process, and/or compute an answer to earn a series of points. A student may receive partial or full credit on CR items, but maximum

point values will vary by task. Maximum values for CR items are 3, 4, or 6 points. When responding to a CR item, students will type their responses into a response box, like the one shown.



Response Box

The response box allows students to use the keyboard to type in their response or work. There is a limit to the number of characters that can be typed in the response box; however, it is set will beyond what a student might produce based on grade-specific expectations of the item. The toolbar at the top of the response box has the Equation Builder tool that allows the students to create a response with commonly used grade-specific mathematical symbols.

Equation Builder

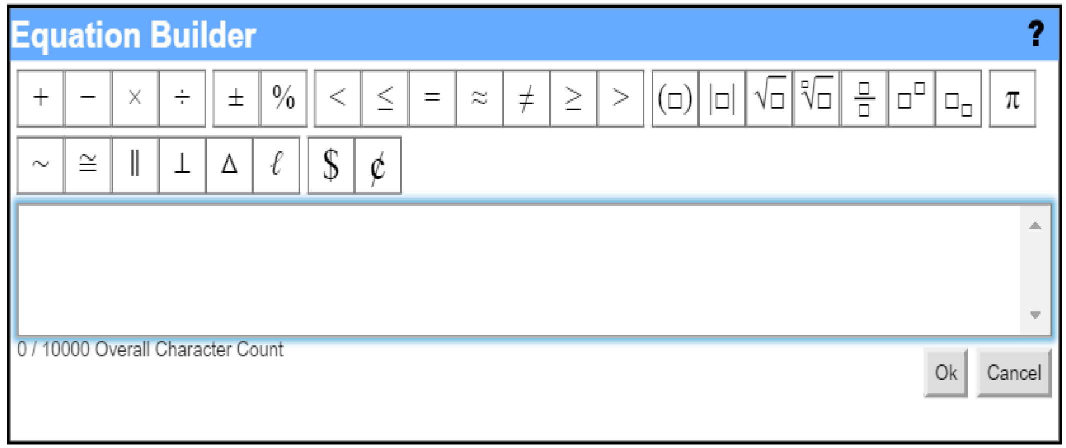
Students are **not** required to use the equation builder for any symbols that are also available on the keyboard. For example, students may use a slash, forward / or back \, to represent a fraction, a carat ^ to represent exponents, or a pair of pipes || to represent absolute value.

Additionally, symbols like degree ° and perpendicular ⊥ are not available on the keyboard, but students may type the words “degrees” and “perpendicular” as necessary. Other symbols, such as square root √ and pi π, are not available on the keyboard, but may be required in symbol form for expressions and equations.

The Equation Builder does not include all symbols/characters students might need to type into the response box. Students should know how to type a negative sign - and a colon : using the keyboard. The × button in the Equation Builder is a multiplication symbol and should not be used as a variable x, but students are not penalized if they do.

Using the Equation Builder

- To enter text, click pointer in the **Response Box** and type text using the keyboard.
- Click on the **Equation Builder button** to open the tool and enter any mathematical symbols, characters, or format.
- When finished, click on the **OK** button in the lower-right corner of the Equation Builder tool – the equation will be entered into the response box.
- To cancel what you have entered, click on the **Cancel** button in the lower-right corner of the Equation Builder tool and you will be returned to the response box.
- To edit an existing equation, double-click on the equation in the Response Box. This will re-open the Equation Builder.



Online Tools

The tests include the following online tools, which allow a student to select answer choices, “mark” tasks, eliminate answer options, use a calculator, take notes, enlarge the task, guide the reading of a task line by line, see the mathematics reference sheet, use a ruler, and use an equation builder for entering special characters. A help tool is also featured to assist students as they use the online system.

- Pointer tool
- Highlighter tool
- Cross-Off tool
- Calculator
- Sticky Note tool
- Magnifying tool
- Line Guide
- Graphing tool
- Equation Builder
- Help tool
- Reference Sheet

All students should work through the Online Tools Training (available in INSIGHT or through this link using the Chrome browser) to practice using the online tools so they are well prepared to navigate the online testing system.

Spanish Math Guidelines

Spanish-language versions of the LEAP 2025 mathematics assessments are available. The following guidelines should be used when assigning a student to a Spanish-language mathematics assessment. The student should meet at least one of the following criteria.

- A student whose primary language is Spanish and who receives instruction in Spanish
- A student who is a recently arrived EL and had prior instruction in mathematics in Spanish
- A student who is enrolled in a dual-language immersion program that includes where mathematics is taught in Spanish

Consideration of the following is strongly urged when deciding which version of the mathematics assessment form (i.e., English-language or Spanish-language version) is best for a Spanish-speaking student.

- The language in which a student receives instruction affects their performance.
- A Spanish-speaking student who is not receiving instruction in Spanish may not have knowledge of math-specific terms translated to Spanish.
- A Spanish-speaking student may not have the literacy skills required to read in Spanish (speaking Spanish is not the same as reading Spanish).

If a teacher is unsure whether the Spanish-language version is appropriate for a specific student, it is recommended that the student take one session of the practice test in English and one session in Spanish in order to determine the language in which the student is most comfortable.

Permitted Testing Materials

Required Tools	Provided	Session 1a	Sessions 1b, 2, & 3	Guidelines
scratch paper (lined, graph, un-lined), two pencils	by Test Administrator	YES	YES	• Reference sheets may be printed from the DRC Insight Portal (*eDirect)* • Tools provided by Test Administrator must not be written on • See Calculator Policy for calculator specifications
calculator	online and/or by Test Administrator	NO	YES	
High School Mathematics Reference Sheet	online and/or by Test Administrator	YES	YES	

Calculator Policy

The Algebra I test allows a graphing calculator (recommended) or scientific calculator during Sessions 1b, 2 and 3. Calculators are **not** allowed during Session 1a of the test. For students with the approved accommodation, a graphing calculator (recommended) or scientific calculator is allowed during all test sessions. Students should use the calculator they have regularly used throughout the school year in their classroom and are most familiar with, provided their regular-use calculator is not outside the boundaries of what is allowed. The following table includes calculator information by session for both general testers and testers with approved accommodations for calculator use.

Calculator Policy	Session 1a	Sessions 1b, 2, & 3
General Testers	Not allowed	Graphing calculator and scientific calculator available online, may use a handheld graphing calculator (recommended) or scientific calculator
Testers with approved accommodation for calculator use	Graphing calculator and scientific calculator provided online, may also have handheld	
Additional information for testers with approved accommodations for calculator use: • If a student needs an adaptive calculator (e.g., large key, talking), the student may bring his or her own or the school may provide one, as long as it is specified in his or her approves IEP or 504 Plan.		

NOTE: Please refer to Louisiana Desmos for more information about the online graphing calculator used on LEAP 2025 Algebra I assessment.
To become familiar with the testing version of the online graphing calculator, teachers and students can visit Desmos for more practice.

Schools must adhere to the following guidance regarding calculators.

- Calculators with the following features are **not** permitted:
  - Computer Algebra System (CAS) features,
  - “QWERTY” keyboards,
  - paper tape
  - talk or make noise, unless specified in IEP/IAP
  - tablet, laptop (or PDA), phone-based, or wristwatch
- Students are **not** allowed to share calculators within a testing session.
- Test administrators must confirm that memory on all calculators has been cleared before and after the testing sessions.
- If schools or school systems permit students to bring their own hand-held calculators, test administrators must confirm that the calculators meet all the requirements as defined above.

Online Scientific Calculator and Graphing Calculator

Reference Sheet

Students in Algebra I will be provided a reference sheet online with the information shown. The High School Reference sheet may be printed from the DRC Insight Portal (*e*Direct) or found in the Assessment Guidance library on page 5 of LEAP 2025 Grades 5-HS Mathematics Reference Sheets.

- 1 inch = 2.54 cm
- 1 m = 39.37 inches
- 1 mile = 5280 feet
- 1 mile = 1760 yards
- 1 mile = 1.609 km
- 1 km = 0.62 mile

- 1 pound = 16 ounces
- 1 pound = 0.454 kg
- 1 kg = 2.2 pounds
- 1 ton = 2000 pounds
- 1 cup = 8 fluid ounces
- 1 pint = 2 cups

- 1 quart = 2 pints
- 1 gallon = 4 quarts
- 1 gallon = 3.785 L
- 1 L = 0.264 gallon
- 1 L = 1000 cubic cm

Triangle	$A = \frac{1}{2}bh$
Parallelogram	$A = bh$
Circle	$A = \pi r^2$
Circle	$C = \pi d$ or $C = 2\pi r$
General prisms	$V = Bh$
Cylinder	$V = \pi r^2 h$
Sphere	$V = \frac{4}{3}\pi r^3$
Cone	$V = \frac{1}{3}\pi r^2 h$
Pyramid	$V = \frac{1}{3}Bh$

Quadratic formula	$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
Radians	1 radian = $\frac{180}{\pi}$ degrees
Degrees	1 degree = $\frac{\pi}{180}$ radians
Arithmetic Sequence	$a_n = a_1 + (n-1)d$
Geometric Sequence	$a_n = a_1 r^{n-1}$
Geometric Series	$S_n = \frac{a_1 - a_1 r^n}{1 - r}$ where $r \neq 1$

SAMPLE TEST ITEMS

This section includes five Type I tasks, one Type II task, and one Type III task as they would appear on a CBT form. The answer key for each Type I task and scoring rubrics for each constructed-response task is located in Appendix B. Look for some of these tasks in the OTT.

4-point Type I Task: Short Answer, Multiple-Choice, Technology-Enhanced Coordinate Grid

Tonya's class planted sunflowers and the students are tracking the growth of their individual plants. The table shows the height of Tonya's plant t days after she planted her sunflower seed.

Time (days)	Height (inches)
10	4
20	8
30	12
40	16

Part A

If the growth of the sunflower continues at the same rate, wha expected height, in inches, on day 55?

Enter your answer in the box.

[   ] inches

Tonya's class planted sunflowers and the students are tracking the growth of their individual plants. The table shows the height of Tonya's plant t days after she planted her sunflower seed.

Time (days)	Height (inches)
10	4
20	8
30	12
40	16

Part B

Based on the data in the table, which function is an appropriate model for the height, $h(t)$, in inches?

ⓐ $h(t) = 4t$

ⓑ $h(t) = \frac{1}{4}t$

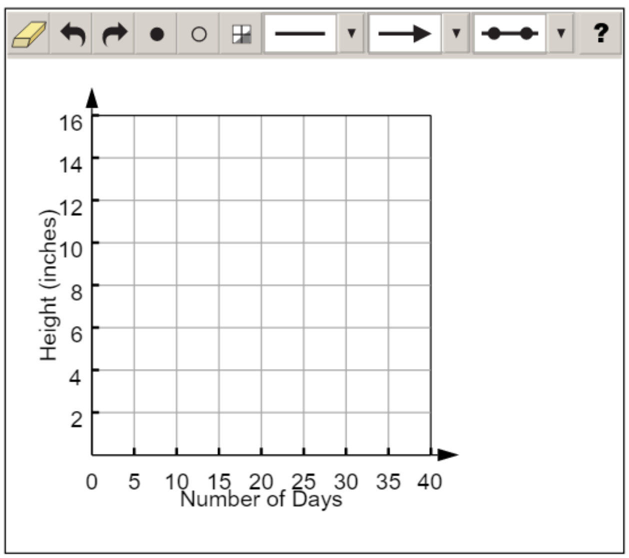
ⓒ $h(t) = \frac{5}{2}t$

ⓓ $h(t) = \frac{2}{5}t$

Part C

On the given *xy*-coordinate plane, graph the function *h*.

To graph a line, click the line button. Then, click a place on the coordinate plane to represent one point on the line and drag the pointer to another point on the line, and a line will appear.



Tonya's class planted sunflowers and the students are tracking the growth of their individual plants. The table shows the height of Tonya's plant *t* days after she planted her sunflower seed.

Time (days)	Height (inches)
10	4
20	8
30	12
40	16

Part D

What is an appropriate domain for the function in context?

ⓐ integers only

ⓑ nonnegative integers only

ⓒ all real numbers

ⓓ all nonnegative real numbers

2-point Type I Task: Multiple-Select

A parabola with the equation $y = a(x - b)^2 + c$ has a minimum at the point (2, –1) and a y-intercept of 3 when graphed in the xy-coordinate plane.

Part A

What are the values of a, b, and c?

Select the **three** that apply.

- (a) $a = -1$
- (b) $a = 1$
- (c) $a = 2$
- (d) $b = -2$
- (e) $b = 2$
- (f) $c = -1$
- (g) $c = 1$

A parabola with the equation $y = a(x - b)^2 + c$ has a minimum at the point (2, –1) and a y-intercept of 3 when graphed in the xy-coordinate plane.

Part B

What are the x-intercepts of the parabola?

Select **all** that apply.

- (a) –3
- (b) –2
- (c) –1
- (d) 0
- (e) 1
- (f) 2
- (g) 3

1-point Type I Task: Technology-Enhanced Drop-Down Menu

Select from the drop-down menus to correctly complete the sentences.

The sum $\frac{1}{3}+\frac{\sqrt{5}}{3}$ is [▼] because the sum [▼] be expressed as a single fraction with a rational numerator and a rational denominator.

- rational
- irrational

- can
- cannot

The quotient $\frac{20}{\sqrt{16}}$ is [▼] because the quotient [▼].

- rational
- irrational

- has a square root in its denominator
- is equal to an integer

1-point Type I Task: Technology-Enhanced Drag-and-Drop

The table shows values for a linear function, *f*.

x	$f(x)$
–1	–8
3	–5
7	–2
11	1

What is the equation for the function *f*?

Drag and drop the numbers into the boxes. **Not** all numbers listed will be used.

?

$-\frac{29}{4}$ $\quad -\frac{3}{4}$ $\quad \frac{3}{4}$ $\quad \frac{4}{3}$ $\quad \frac{11}{4}$

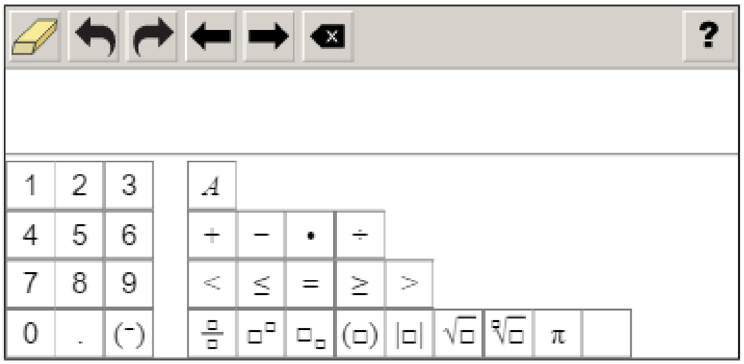
$$f(x) = \boxed{}\,x + \boxed{}$$

1-point Type I Task: Technology-Enhanced Keypad Input

The area, A, of a rectangular parking lot is given by the equation $A = 16s^2 + 25$. Jacob knows the area of the parking lot and wants to find s. Solve $A = 16s^2 + 25$ for s.

Enter your answer in the box provided. Enter **only** your answer.

$s =$



4-point Type II Task: Constructed-Response

Part A

List the steps to solve the equation $x^2 + 12x - 28 = 0$ by completing the square, and give the solution or solutions.

Enter your work and your answers in the box provided.

EQ

Part B

Explain what value or values of c make the equation $x^2 + 12x + c = 0$ have one and only one solution. Justify your answer.

Enter your answer and your justification in the box provided.

EQ

3-point Type III Task: Constructed-Response

A quality-control technician at a candle factory tested eight 16-ounce candles, each 3 inches in diameter. These candles came from the same production run. The table shows the decrease in weight of each candle after burning for 3 hours. Candle makers believe that the rate at which the candles burn is constant.

Candle	1	2	3	4	5	6	7	8
Weight Loss (ounces)	0.5	0.6	0.5	0.7	0.7	0.5	0.5	0.6

Write an equation that can be used to model the weight, w of such a candle as a function of h, the number of hours burning. Then, explain how the equation can be used to predict the weight of a candle that has burned for 5 hours.

Enter your equation and your explanation in the box provided.

EQ

RESOURCES

Assessment Guidance Library

- LEAP 2025 Equation Builder Guide for High School: provides information on using the equation builder; Spanish
- LEAP 2025 Grades 5-HS Mathematics Reference Sheets: includes all the mathematics references sheets provided for LEAP 2025 testing; used for both Algebra I and Geometry
- Desmos: link to Desmos free online graphing calculator and resources for its use (Practice with testing version HERE)
- Assessment Development Educator Review Committees: describes the item development process and associated committees, includes information on applying for participation

Practice Test Library

- LEAP 2025 Algebra I Practice Test and Answer Key: includes answer keys, scoring rubrics, and alignment information
- LEAP 2025 Mathematics Practice Test Guidance: provides guidance on how teachers might better use the practice tests
- Practice Test Quick Start Guide: provides information regarding administration and scoring of the online practice tests

Assessment Library

- LEAP 2025 Accessibility and Accommodations Manual: provides information about accessibility features and accommodations
- LEAP 2025 Technology Enhanced Item Types: provides a summary of technology enhanced items students may encounter
- Achievement Level Descriptors: descriptions of the knowledge, skills, and cognitive processes that students should demonstrate with relative consistency and accuracy at each level of achievement
- LEAP 360: non-summative assessment system; includes diagnostic and interim assessments

EAGLE: instructional resources in grade-level documents that teachers can download from the webpage and incorporate into their daily instruction; contact school test coordinator for instructions on accessing the files. For more information, refer to A Teacher's Guide to LEAP 360.

DRC Insight Portal (eDIRECT)

- includes access to tutorials, manuals, and user guides

INSIGHT™

- Online Tools Training: allows students to become familiar with the tools available in the online testing platform; also available through this link using the Chrome browser
- LEAP 2025 Algebra I Practice Test: helps prepare students for the tests

K-12 Math Planning Resources

- K-12 Louisiana Student Standards for Math: explains the development of and lists the math content standards for Louisiana students
- Algebra I - Teachers Companion Document 2.0: contains descriptions of each standard to answer questions about the standard's meaning and how it applies to student knowledge and performance
- Algebra I Learning Acceleration Guidance: reference guide for teachers to help them more quickly identify the specific remedial standards necessary for every standard, includes information on content emphasis
- K-12 LSSM Alignment to Rigor: provides explanations and a standards-based alignment to assist teachers in providing a rigorous education

Contact Us

- assessment@la.gov for assessment questions
- classroomsupporttoolbox@la.gov for curriculum and instruction questions
- AskLDOE for general questions
- ldoecommunications@la.gov to subscribe to newsletters; include the newsletter(s) you want to subscribe to in your email

Newsroom: offers archive copies of newsletters including the LDOE Weekly School System Newsletter and the Teacher Leader Newsletter

APPENDIX A

Assessable Content for the Major Content Reporting Category (Type I)

LSSM Content Standards	
■ A1: A-SSE.A.1	Interpret expressions that represent a quantity in terms of its context. a. Interpret parts of an expression, such as terms, factors, and coefficients. b. Interpret complicated expressions by viewing one or more of their parts as a single entity. *For example, interpret* $P(1+r)^n$ *as the product of P and a factor not depending on P.*
■ A1: A-SSE.A.2	Use the structure of an expression to identify ways to rewrite it. *For example, see* $x^4 - y^4$ *as* $(x^2)^2 - (y^2)^2$, *or see* $2x^2 + 8x$ *as* $(2x)(x) + 2x(4)$, *thus recognizing it as a polynomial whose terms are products of monomials and the polynomial can be factored as* $2x(x+4)$.
■ A1: A-APR.A.1	Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.
■ A1: A-CED.A.3	Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. *For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.*
■ A1: A-CED.A.4	Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. *For example, rearrange Ohm's law* $V = IR$ *to highlight resistance R.*
■ A1: A-REI.B.3	Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
■ A1: A-REI.B.4	Solve quadratic equations in one variable. a. Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x – p)^2 = q$ that has the same solutions. Derive the quadratic formula from this form. b. Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as “no real solution.”
■ A1: A-REI.D.10	Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).
■ A1: A-REI.D.11	Explain why the *x*-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, piecewise linear (to include absolute value), and exponential functions.
■ A1: A-REI.D.12	Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.

A1: F-IF.A.1	Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and *x* is an element of its domain, then *f*(*x*) denotes the output of *f* corresponding to the input *x*. The graph of *f* is the graph of the equation *y* = *f*(*x*).
A1: F-IF.A.2	Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.
A1: F-IF.B.4	For linear, piecewise linear (to include absolute value), quadratic, and exponential functions that model a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; and end behavior.*
A1: F-IF.B.5	Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. *For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.*
A1: F-IF.B.6	Calculate and interpret the average rate of change of a linear, quadratic, piecewise linear (to include absolute value), and exponential function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.
LEAP 2025 Evidence Statements	
LEAP.I.A1.1	Understand the concept of a function and use function notation. Content Scope: Knowledge and skills articulated in • A1: F-IF.A – Tasks require students to use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a real-world context.
LEAP.I.A1.2	Given a verbal description of a linear or quadratic functional dependence, write an expression for the function and demonstrate various knowledge and skills articulated in the Functions category in relation to this function. Content Scope: Knowledge and skills articulated in • A1: F-IF, A1: F-BF, A1: F-LE – Given a verbal description of a functional dependence, the student would be required to write an expression for the function; identify a natural domain for the function given the situation; use a graphing tool to graph several input-output pairs; select applicable features of the function, such as linear, increasing, decreasing, quadratic, nonlinear; and find an input value leading to a given output value.[1]

[1] Some examples: (1) A functional dependence might be described as follows: "The area of a square is a function of the length of its diagonal." The student would be asked to create an expression such as $f(x) = \frac{1}{2}x^2$ for this function. The natural domain for the function would be the positive real numbers. The function is increasing and nonlinear. (2) A functional dependence might be described as follows: "The slope of the line passing through the points $(1, 3)$ and $(7, y)$ is a function of *y*." The student would be asked to create an expression such as $s(y) = \frac{(3-y)}{(1-7)}$ or this function. The natural domain for this function would be the real numbers. The function is increasing and linear.

LEAP.I.A1.3	Solve multi-step contextual word problems with degree of difficulty appropriate to the course, requiring application of course-level knowledge and skills articulated in • A1: S-ID, excluding normal distributions and limiting function fitting to linear functions and quadratic functions o Tasks should go beyond 6.SP.4. o For tasks that use bivariate data, limit the use of time series. Instead, use data that may have variation in the *y*-values for given *x*-values, such as pre and post test scores, height and weight, etc. o Predictions should not extrapolate far beyond the set of data provided. o Line of best fit is always based on the equation of the least squares regression line either provided or calculated through the use of technology. o To investigate associations, students may be asked to evaluate scatter plots that may be provided or created using technology. Evaluation includes shape, direction, strength, presence of outliers, and gaps. o Analysis of residuals may include the identification of a pattern in a residual plot as an indication of a poor fit. o Quadratic models may assess minimums/maximums, intercepts, etc.
LEAP.I.A1.4	Solve multi-step contextual problems with degree of difficulty appropriate to the course by constructing quadratic function models and/or writing and solving quadratic equations. Content Scope: Knowledge and skills articulated in • A1: A-SSE.B.3, A1: A-APR.B.3, A1: A-CED.A.1, A1: A-REI.B.4, A1: F-IF.B.4, A1: F-IF.B.6, A1: F-IF.C.7a, A1: F-IF.C.8, A1: F-IF.C.9, A1: F-BF.A.1a, A1: F-BF.B.3, A1: F-LE.B.5 – A scenario might be described and illustrated with graphics (or even with animations in some cases). Solutions may be given in the form of decimal approximations. For rational solutions, exact values are required. For irrational solutions, exact or decimal approximations may be required. Simplifying or rewriting radicals is not required.[2]
LEAP.I.A1.5	Solve multi-step mathematical problems with degree of difficulty appropriate to the course that requires analyzing quadratic functions and/or writing and solving quadratic equations. Content Scope: Knowledge and skills articulated in • A1: A-SSE.B.3, A1: A-APR.B.3, A1: A-CED.A.1, A1: A-REI.B.4, A1: F-IF.B.4, A1: F-IF.B.6, A1: F-IF.C.7a, A1: F-IF.C.8, A1: F-IF.C.9, A1: F-BF.A.1a, A1: F-BF.B.3, A1: F-LE.B.5 – Tasks do not have a real-world context. Exact answers may be required or decimal approximations may be given. Students might choose to take advantage of the graphing utility to find approximate answers or clarify the situation at hand. For rational solutions, exact values are required. For irrational solutions, exact or decimal approximations may be required. Simplifying or rewriting radicals is not required.[3]

[2] Some examples: (1) A company sells steel rods that are painted gold. The steel rods are cylindrical in shape and 6 cm long. Gold paint costs $0.15 per square inch. Find the maximum diameter of a steel rod if the cost of painting a single steel rod must be $0.20 or less. You may answer in units of centimeters or inches. Give an answer accurate to the nearest hundredth of a unit. (2) As an employee at the Gizmo Company, you must decide how much to charge for a gizmo. Assume that if the price of a single gizmo is set at *P* dollars, then the company will sell $1000 - 0.2P$ gizmos per year. Write an expression for the amount of money the company will take in each year if the price of a single gizmo is set at *P* dollars. What price should the company set in order to take in as much money as possible each year? How much money will the company make per year in this case? How many gizmos will the company sell per year? (Students might use graphical and/or algebraic methods to solve the problem.) (3) At $t = 0$, a car driving on a straight road at a constant speed passes a telephone pole. From then on, the car's distance from the telephone pole is given by $C(t) = 30t$, where *t* is in seconds and *C* is in meters. Also at $t = 0$, a motorcycle pulls out onto the road, driving in the same direction, initially 90 m ahead of the car. From then on, the motorcycle's distance from the telephone pole is given by $M(t) = 90 + 2.5t^2$, where *t* is in seconds and *M* is in meters. At what time t does the car catch up to the motorcycle? Find the answer by setting *C* and *M* equal. How far are the car and the motorcycle from the telephone pole when this happens? (Students might use graphical and/or algebraic methods to solve the problem.)

[3] Some examples: (1) Given the function $f(x) = x^2 + x$, find all values of *k* such that $f(3 - k) = f(3)$. (Exact answers are required.) (2) Find a value of *c* so that the equation $2x^2 - cx + 1 = 0$ has a double root. Give an answer accurate to the tenths place.

LEAP.I.A1.6	Solve multi-step contextual word problems with degree of difficulty appropriate to the course, requiring application of course-level knowledge and skills articulated in • A1: F-LE, A1: A-CED.A.1, A1: A-SSE.B.3, A1: F-IF.B, A1: F-IF.C.7, limited to linear functions, quadratic functions, and exponential functions. A1: F-LE.A is the primary content and at least one of the other listed content elements will be involved in tasks as well. For rational solutions, exact values are required. For irrational solutions, exact or decimal approximations may be required. Simplifying or rewriting radicals is not required.

Assessable Content for the Additional & Supporting Content Reporting Category (Type I)

LSSM Content Standards	
A1: A-SSE.B.3	Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. a. Factor a quadratic expression to reveal the zeros of the function it defines. b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines. c. Use the properties of exponents to transform expressions for exponential functions emphasizing integer exponents. *For example, the growth of bacteria can be modeled by either* $f(t) = 3^{(t+2)}$ *or* $g(t) = 9(3^t)$ *because the expression* $3^{(t+2)}$ *can be rewritten as* $(3^t)(3^2) = 9(3^t)$.
A1: A-APR.B.3	Identify zeros of quadratic functions, and use the zeros to sketch a graph of the function defined by the polynomial.
A1: A-REI.C.6	Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.
A1: F-IF.C.7	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. a. Graph linear and quadratic functions and show intercepts, maxima, and minima. b. Graph piecewise linear (to include absolute value) and exponential functions.
A1: F-IF.C.8	Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.
A1: F-IF.C.9	Compare properties of two functions (linear, quadratic, piecewise linear [to include absolute value] or exponential) each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *For example, given a graph of one quadratic function and an algebraic expression for another, determine which has the larger maximum.*
A1: F-BF.B.3	Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k f(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative). Without technology, find the value of k given the graphs of linear and quadratic functions. With technology, experiment with cases and illustrate an explanation of the effects on the graph that include cases where $f(x)$ is a linear, quadratic, piecewise linear (to include absolute value) or exponential function.

A1: F-LE.A.2	Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).
A1: S-ID.B.5	Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.
LEAP 2025 Evidence Statements	
LEAP.I.A1.7	Apply properties of rational and irrational numbers to identify rational and irrational numbers. Content Scope: Knowledge and skills articulated in • A1: N-RN.B – Tasks should go beyond asking students to only identify rational and irrational numbers. This evidence statement is aligned to the cluster heading. This allows other cases besides the three cases listed in N-RN.3 to be assessed.

Assessable Content for the Expressing Mathematical Reasoning Reporting Category (Type II)

LEAP 2025 Evidence Statements	
LEAP.II.A1.1	Base explanations/reasoning on the properties of rational and irrational numbers. Content scope: Knowledge and skills articulated in • A1: N-RN.B.3 – For rational solutions, exact values are required. For irrational solutions, exact or decimal approximations may be required. Simplifying or rewriting radicals is not required.
LEAP.II.A1.2	Given an equation or system of equations, reason about the number or nature of the solutions. Content scope: Knowledge and skills articulated in • A1: A-REI.B.4a, A1: A-REI.B.4b, limited to real solutions only. • A1: A-REI.D.11, limited to equations of the form $f(x) = g(x)$ where f and g are linear or quadratic.
LEAP.II.A1.3	Given a system of equations, reason about the number or nature of the solutions. Content scope: Knowledge and skills articulated in • A1: A-REI.C.5
LEAP.II.A1.4	Base explanations/reasoning on the principle that the graph of an equation and inequalities in two variables is the set of all its solutions plotted in the coordinate plane. Content scope: Knowledge and skills articulated in • A1: A-REI.D, excluding exponential functions.
LEAP.II.A1.5	Construct, autonomously, chains of reasoning that will justify or refute algebraic propositions or conjectures. Content scope: Knowledge and skills articulated in • A1: A-APR.A.1
LEAP.II.A1.6	Express reasoning about transformations of functions. Content scope: Knowledge and skills articulated in • A1: F-BF.B.3, limited to linear and quadratic functions. Tasks will not involve ideas of even or odd functions.
LEAP.II.A1.7	Express reasoning about linear and exponential growth. Content scope: Knowledge and skills articulated in • A1: F-LE.A.1a

LEAP.II.A1.8	Construct, autonomously, chains of reasoning that will justify or refute propositions or conjectures about functions. Content scope: Knowledge and skills articulated in • A1: F-IF.C.8a – Tasks involve using algebra to prove properties of given functions.[4] Scaffolding is provided to ensure tasks have appropriate level of difficulty.[5] Tasks may have a mathematical or real-world context.
LEAP.II.A1.9	Given an equation or system of equations, present the solution steps as a logical argument that concludes with the set of solutions (if any). Content scope: Knowledge and skills articulated in • A1: A-REI.A.1, A1: A-REI.B.4a, A1: A-REI.B.4b, limited to quadratic equations and real solutions.
LEAP.II.A1.10	Construct, autonomously, chains of reasoning that will justify or refute propositions or conjectures about linear equations in one or two variables. Content scope: Knowledge and skills articulated in • 8.EE.B – Revisiting content initially introduced in grade 8, from a more mature reasoning perspective

Assessable Content for the Modeling & Applications Reporting Category (Type III)

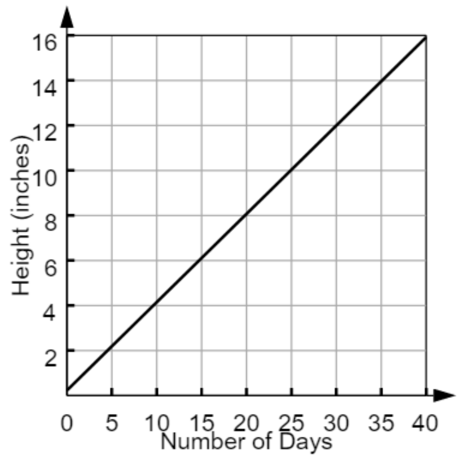
LEAP 2025 Evidence Statements	
LEAP.III.A1.1	Solve multi-step contextual problems with degree of difficulty appropriate to the course. Content scope: Knowledge and skills articulated in • 7.RP.A, 7.NS.A.3, 7.EE, and/or 8.EE
LEAP.III.A1.2	Solve multi-step contextual word problems with degree of difficulty appropriate to the course. Content scope: Knowledge and skills articulated in • A1: A-CED, A1: N-Q, A1: A-SSE.B.3, A1: A-REI.C.6, A1: A-REI.D.11, A1: A-REI.D.12, limited to linear equations and exponential equations with integer exponents. A1: A-CED is the primary content; other listed content elements may be involved in tasks as well. • A1: F-BF.A.1a, A1: F-BF.B.3, A1: A-CED.A.1, A1: A-SSE.B.3, A1: F-IF.B, A1: F-IF.C.7, limited to linear functions and quadratic functions. A1: F-BF.A.1a is the primary content; other listed content elements may be involved in tasks as well.
LEAP.III.A1.3	Micro-models: Autonomously apply a technique from pure mathematics to a real-world situation in which the technique yields valuable results even though it is obviously not applicable in a strict mathematical sense (e.g., profitably applying proportional relationships to a phenomenon that is obviously nonlinear or statistical in nature). Content Scope: Knowledge and skills articulated in A1: A-CED.A.3, A1: F-IF.A.2, A1: F-IF.B.4, A1: F-IF.B.5, A1: F-IF.B.6, A1: F-LE.A.2, and/or 8.EE.B.6.
LEAP.III.A1.4	Reasoned estimates: Use reasonable estimates of known quantities in a chain of reasoning that yields an estimate of an unknown quantity. Content Scope: Knowledge and skills articulated in A1: A-CED.A.3, A1: F-LE.A.2, A1: F-IF.A.2, A1: F-IF.B.6, and/or 8.EE.B.6.

[4] Some examples: (1) Prove algebraically that the function $h(t) = t(t-1)$ has minimum value of -$\frac{1}{4}$. (2) Prove algebraically that the graph of $g(x) = x^2 - x + 14$ is symmetric about the line $x = \frac{1}{2}$. (3) Prove that $x^2 + 1$ is never less than $-2x$.

[5] Example: (1) The prompt could show the graphs of $x^2 + 1$ and $-2x$ on the same set of axes, and say, "From the graph, it looks as if $x^2 + 1$ is never less than $-2x$. In this task, you will use algebra to prove it." And so on, perhaps with additional hints or scaffolding.

APPENDIX B

Answer Key/Rubrics for Sample Items

Item Type	Key	Alignment
4-point Type I Task: Fill-in-the-Blank, Multiple-Choice, Technology-Enhanced Coordinate Grid	Part A: 22 Part B: D Part C:  Part D: D	LEAP.I.A1.6
2-point Type I Task: Multiple-Select	Part A: B, E, F Part B: E, G	A1: F-IF.B.4
1-point Type I Task: Technology-Enhanced Drop-Down Menu	irrational because the sum cannot rational because the quotient is equal to an integer	LEAP.I.A1.7
1-point Type I Task: Technology-Enhanced Drag-and-Drop	$f(x) = \boxed{\frac{3}{4}}x + \boxed{-\frac{29}{4}}$	A1: F-LE.A.2
1-point Type I Task: Technology-Enhanced Keypad Input	$\sqrt{\frac{A-25}{16}}$	A1: A-CED.A.4
4-point Type II Task: Constructed-Response	Part A: see rubric Part B: see rubric	LEAP.II.A1.9
3-point Type III Task: Constructed-Response	see rubric	LEAP.III.A1.3

Type II Constructed-Response Rubric

PART A	
Score	**Description**
2	**Reasoning component:** Algebraic or written explanation for solving the equation **Computation component:** Solution of $x = 2$ or -14 Sample Student Response: $x^2 + 12x - 28 = 0$ $x^2 + 12x = 28$ $x^2 + 12x + 36 = 28 + 36$ $(x + 6)^2 = 64$ $x + 6 = \pm 8$ $x = 8 - 6 = 2$ or $x = -8 - 6 = -14$
1	Student response includes 1 of the 2 elements.
0	Student response is incorrect or irrelevant.

PART B	
Score	**Description**
2	**Reasoning component:** Valid explanation **Computation component:** Solution of $c = 36$ Sample Student Response: There would be only one solution if the factors of the polynomial are the same. If the factors are the same, then the identity $(x + a)^2 = x^2 + 2ax + a^2$ can be used. The middle term is 12, or *c,* would have to be the square of half of that number. Therefore $c = 36$.
1	Student response includes 1 of the 2 elements.
0	Student response is incorrect or irrelevant.

Type III Constructed-Response Rubric

<table>
<tr><th>Score</th><th>Description</th></tr>
<tr><td>3</td><td>Modeling component:
Correct equation, $w \approx 16 - 0.19h$
Accurate use of notation and vocabulary to support correct calculations and mathematical reasoning, identifying variables as needed
Computation component: Correct application of the model to make an accurate prediction

Sample Student Response:
If the burn rate is believed to be constant, determine the average burn rate for the eight candles as the ratio of weight loss per hour.

ounces lost over three hours $\frac{0.5+0.6+0.5+0.7+0.7+0.5+0.5+0.6}{8} \approx 0.575$

ounces lost per hour on average $\frac{0.575}{3} \approx 0.19$

For 0 hours, the weight of each candle is 16 ounces. Therefore, $w \approx 16 - 0.19h$.
This model can be used to predict the weight of the candle when h, the number of hours of burning, is 5.
$w \approx 16 - 0.19(5)$
$w \approx 16 - 0.95$
$w \approx 15.05$

According to the model, the weight of the candle after 5 hours of burning would be about 15.05 ounces.</td></tr>
<tr><td>2</td><td>Student response includes 2 of the 3 elements.</td></tr>
<tr><td>1</td><td>Student response includes 1 of the 3 elements.</td></tr>
<tr><td>0</td><td>Student response is incorrect or irrelevant.</td></tr>
</table>