

Massachusetts Tests for Educator Licensure[®]

TEST INFORMATION BOOKLET

52 Academically Advanced

MA-SG-FLD052-03

Massachusetts Department of Education

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Test Information Booklet Order Form

Academically Advanced
(Field 52)

Test Overview Chart

Test Objectives

Sample Test Items

Answer Key and Sample Response

***Test Overview Chart:
Academically Advanced (52)***

Subareas	Approximate Number of Multiple-Choice Items	Number of Open-Response Items
I. Curricular Content	61–63	
II. Promoting Learning in Academically Advanced Students	37–39	
III. Application of Knowledge and Understanding		2

The Academically Advanced test is designed to assess the candidate's knowledge of the subject matter required for the Massachusetts Academically Advanced license. This subject matter knowledge is delineated in the Massachusetts Department of Education's *Regulations for Educator Licensure and Preparation Program Approval* (7/2001), 603 CMR 7.06 "Subject Matter Knowledge Requirements for Teachers."

The Academically Advanced test assesses the candidate's proficiency and depth of understanding of the subject at the level required for a baccalaureate major, according to Massachusetts standards. Candidates are typically nearing completion of or have completed their undergraduate work when they take the test.

The multiple-choice items on the test cover the subareas as indicated in the chart above. The open-response items may relate to topics covered in any of the subareas and will typically require breadth of understanding of the academically advanced field and the ability to relate concepts from different aspects of the field. Responses to the open-response items are expected to be appropriate and accurate in the application of subject matter knowledge, to provide high-quality and relevant supporting evidence, and to demonstrate a soundness of argument and understanding of the academically advanced field.

Test Objectives:
Academically Advanced (52)

Massachusetts Tests for Educator Licensure™

**FIELD 52: ACADEMICALLY ADVANCED
TEST OBJECTIVES**

Subarea

	Multiple-Choice	Range of Objectives	Approximate Test Weighting
I.	Curricular Content	01–04	50%
II.	Promoting Learning in Academically Advanced Students	05–07	<u>30%</u>
			80%
	Open-Response		
III.	Application of Knowledge and Understanding	08	20%

SUBAREAS:

CURRICULAR CONTENT
PROMOTING LEARNING IN ACADEMICALLY ADVANCED STUDENTS
APPLICATION OF KNOWLEDGE AND UNDERSTANDING

CURRICULAR CONTENT [50%]

0001 Understand literature.

For example: understanding the characteristics of major literary genres (e.g., fiction, nonfiction, drama, poetry); demonstrating knowledge of the elements of fiction (e.g., plot, character, setting, theme); analyzing and interpreting literary devices (e.g., figurative language, imagery, symbolism, rhyme); analyzing excerpts to identify tone, voice, and other stylistic or thematic features; comparing and contrasting information presented in two passages; evaluating the logic, credibility, objectivity, or affective impact of nonfiction passages; demonstrating knowledge of literary response skills; understanding major authors, works, movements, themes, and periods of American and British literature; characteristics of world mythology, folk literature, and traditional narratives; and familiarity with well-known authors and works in African, Asian, European, and Latin American literature.

0002 Understand rhetoric and composition.

For example: understanding principles of rhetoric and uses of language as they apply to various forms and purposes of oral and written communication (e.g., general principles of classical rhetoric; structural devices; application of modern rhetorical principles; strategies for speaking or writing effectively for a variety of audiences, purposes, and contexts; use of arrangement and organization, style and tone, and form of delivery); understanding the composition process (e.g., distinguishing features of various forms of writing; methods for defining a research problem; processes for generating and developing written texts; techniques for gathering, analyzing, and evaluating information; effective sentence, paragraph, and essay development; techniques for improving text organization; selection of appropriate details to support an argument or opinion; use of appropriate rhetorical, logical, and stylistic criteria for assessing written work; revising written texts to improve clarity and economy of expression); understanding the conventions of Standard spoken and written American English (e.g., accurate spelling, punctuation, and capitalization; techniques for editing written texts to achieve conformity with conventions of Standard American English usage and grammatical expression); and demonstrating an understanding of the applications of technology in the writing process.

0003 Understand number theory, algebra, patterns, and functions.

For example: understanding principles of number theory and the real number system; solving problems using number concepts (e.g., percent increase, ratios and proportions); analyzing how number properties relate to algebraic properties; simplifying algebraic expressions; analyzing properties of functions; modeling and solving problems using linear and quadratic functions and systems; understanding graphs, properties, and applications of exponential, polynomial, rational, and absolute value functions and relations; understanding the use of graphing calculators and computers to find numerical solutions to problems; understanding the conceptual basis of introductory calculus (e.g., the concept of limit, the relationship between slope and rates of change, the relationship between integration and the area under a curve); and modeling and solving problems using differentiation and integration.

0004 Understand geometry, trigonometry, data analysis, probability, and discrete mathematics.

For example: using concepts of measurement; understanding the principles of Euclidean geometry and using them to prove theorems (e.g., congruence of triangles, properties of polygons) and justify geometric constructions; modeling and solving problems involving two- and three-dimensional figures; using coordinate and transformational geometry to prove theorems and solve problems (e.g., representing geometric figures in the coordinate plane; types of symmetry; properties of tessellations); applying right triangle trigonometry and the laws of sines and cosines; analyzing graphs and properties of trigonometric functions and their inverses; using trigonometric functions to model and solve real-world periodic phenomena; solving problems using probability (simple and compound) and statistics (data display, measures of central tendency and variability); and understanding the principles of discrete/finite mathematics (e.g., properties of sets, recursive patterns and relations, iteration, finite differences, linear programming, properties of matrices, characteristics and applications of graphs and trees).

PROMOTING LEARNING IN ACADEMICALLY ADVANCED STUDENTS [30%]

0005 Understand the assessment of cognitive abilities and of problem-solving skills in academically advanced students.

For example: demonstrating knowledge of types, uses, benefits, and limitations of formal and informal assessments (e.g., standardized tests, case studies, student portfolios, observations, interviews); creating, selecting, and evaluating assessment instruments and methods, including those used in prereferral situations; using a variety of assessment instruments to identify students who are academically advanced regardless of demographic group and to make recommendations regarding placement, programming, and service delivery; demonstrating an understanding of what constitutes high achievement in major subject areas; using formative and summative assessments to modify instruction and monitor student progress; demonstrating familiarity with terminology used in the assessment of academically advanced students (e.g., ceiling effects, performance gap, out-of-level testing); and communicating assessment and evaluation scores and other results to the appropriate audience.

0006 Understand reasons, uses, and research evidence for differentiated instructional and grouping practices for academically advanced students.

For example: demonstrating knowledge of research-supported strategies and practices for providing instruction for academically advanced students (e.g., acceleration of formal learning by subject or grade level, tiered instruction, curriculum compacting, independent study, mentorships); demonstrating knowledge of important aspects of the instructional process for academically advanced students (e.g., designing advanced learning experiences, creating opportunities for analytical and creative thinking, providing accelerated pacing, promoting the use of research and experimentation); demonstrating knowledge of the principles and practices of differentiated instruction; demonstrating knowledge of the uses of different grouping practices for academically advanced students (e.g., ability grouping, cluster grouping, interest grouping, cross-age grouping); identifying ways to provide systematic, accelerated and enriched instruction in disciplinary and interdisciplinary studies; and identifying ways to modify instruction based on students' specific areas of strength and need.

0007 Understand program options, supplements, and curricular resources for academically advanced students.

For example: demonstrating knowledge of a variety of program options to meet the needs of academically advanced students (e.g., separate advanced academic programs; enrichment and advanced academic pull-out programs; distance learning; after-school, weekend, and summer programs; community-based programs); recognizing the types of services, networks, professional organizations, and general resources available to academically advanced students, their families, and educators; identifying sources of specialized materials and programming for academically advanced students; demonstrating an understanding of current curriculum options for academically advanced students in most schools; and promoting the use of varied and challenging ways for academically advanced students to demonstrate excellence to an appropriate audience.

APPLICATION OF KNOWLEDGE AND UNDERSTANDING [20%]

This section of the test will consist of two open-response items addressing content from the preceding objectives.

0008 Prepare an organized, developed analysis related to topics from one or more of the following: curricular content and promoting learning in academically advanced students.

For example: demonstrating knowledge and understanding of one or more of the following topics: literature with a focus on American and British authors; principles of rhetoric and composition; number theory, algebra, patterns, and functions; geometry, trigonometry, data analysis, probability, and discrete mathematics; the assessment of cognitive abilities and of problem-solving skills in academically advanced students; reasons, uses, and research evidence for differentiated grouping and for instructional practices for academically advanced students; and program options, supplements, and curricular resources for academically advanced students.

Sample Test Items:
Academically Advanced (52)

1. **Read the excerpts below from two different short stories; then answer the question that follows.**

At the Memorial Theater, a couple had arrived late. The usher glanced at the tickets, and grandly led them to their seats. The seats were not good, being all the way to one side, and the theater, with a capacity of almost 500, had barely twenty people in it. The two sat for a few minutes, then rose and moved swiftly into the center section. Just as swiftly, the usher came down the aisle like a troll, gesturing angrily. The pair gestured back. Soon voices were heard above the strains of Beethoven.

So, as I was telling Dave, these two guys walked in and asked for a glass of water. So I took two plastic cups and filled them with water like they asked. I set them down on the counter and said, "That'll be fifty cents," because you know, we have to buy those cups. And the big guy, he said, "Since when do you have to pay for water! Water is free!" So I said, "Well, the cup isn't. Fifty cents." Then they got kind of worked up and stomped out.

A person wishing to contrast the above passages should best focus on the use of:

- A. descriptive language.
- B. plot structure.
- C. narrative elements.
- D. points of view.

2. Read the excerpt below from a novel; then answer the question that follows.

I have to tell you that San Miguel is truly beautiful after a storm. The traffic sizzles with rainwater. Crowds of people gather at the corner of Martinez and 22nd Streets, and indeed, we all crossed the intersection together as if we knew each other. In the distance, a low cloud was caught in the balconies and hanging gardens of a high rise. I saw people boarding a bus and soon they were sleeping as it departed. And look! The rings and necklaces in a jewelry store window, the dress shirts laid out in a spectrum of color, the musical instruments! I tell you, the rain hasn't got a chance against so many colors. I tell you—well, I have to confess I haven't actually *been* in San Miguel. I once saw a photograph of San Miguel in a rainstorm—or maybe it wasn't San Miguel at all; it could have been some other city. To be honest, I don't really care for cities, and as far as I know there never were any sleeping people on a bus, or a shop for musical instruments. The city in the photograph *should* have had a bus full of sleeping people, and a shop full of beautiful stringed instruments. Every city should have such a thing. And perhaps I really did see such a shop once. In fact, maybe it was in San Miguel after all. I am sorry, my memory fails me at times, and I might have misled you.

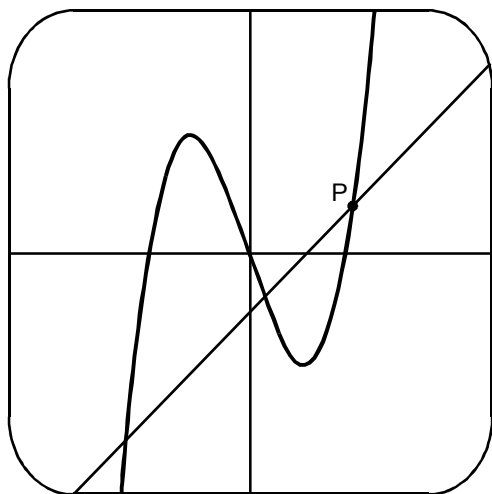
The ambiguity in the above passage about what is true can best be attributed to:

- A. an excessive amount of detail aimed at imparting a mood of uncertainty.
- B. a narrator whose credibility is in question.
- C. an author writing about places that he himself has never visited.
- D. an overly complicated series of statements by the narrator.

3. With which of the following writing tasks would word processing technology be most helpful?

- A. assessing effective style for a persuasive essay
- B. generating ideas for a research paper
- C. choosing appropriate colloquial expressions to include in a speech
- D. revising a short story

4. Use the graphing calculator display below to answer the question that follows.



A student displays the functions $y = x^3 - 3x$ and $y = x - 1$ on the screen of a graphing calculator and uses the trace function to find the coordinates of point P . This is a method for estimating a solution to which of the following equations?

- A. $x^3 - 4x + 1 = 0$
- B. $x^3 - 4x - 1 = 0$
- C. $x^3 - 2x + 1 = 0$
- D. $x^3 - 2x - 1 = 0$

5. What is the period of the function $y = \sin(x + \frac{\pi}{2})$?
- A. $\frac{1}{2}$
 - B. $\frac{\pi}{2}$
 - C. π
 - D. 2π
6. A signal buoy floats on the surface of the water in a coastal bay. As the buoy moves up and down, its height, h , in feet above average sea level is modeled by the equation $h = A \sin \frac{2\pi}{3}t + 6$, where A is a constant (in the equation $t = \text{time}$). During a storm the buoy's height varies from 1 to 11 feet. What is the value of A in the equation?
- A. 5
 - B. 6
 - C. 10
 - D. 12

7. When considering grade level acceleration for an academically advanced student at the elementary school level, decision-makers should first consider the student's:
- A. fine- and gross-motor skills.
 - B. ability to get along with peers.
 - C. current instructional level.
 - D. size and physical maturity.
8. Jamal is a second-grade student in a heterogeneous classroom. He is attentive and responsive during math instruction, but his teacher notices that Jamal quickly loses interest in completing any written activities that reinforce skills and concepts presented during math lessons. Instead of completing class work, he draws on his paper. However, Jamal consistently demonstrates mastery of the given skill set or concept during assessment. Which of the following modifications to math instruction would be most appropriate for Jamal?
- A. sending Jamal to a third-grade math class for advanced instruction
 - B. allowing Jamal to practice math skills on a computer instead of on paper
 - C. accelerating the pace of Jamal's math instruction to match his learning rate
 - D. identifying Jamal as an "assistant teacher" during math class

9. Justine is a sixth-grade student who demonstrated advanced capabilities in the primary grades. She now seems to have lost interest in doing her best in school, and she frequently fails to turn in assignments. Justine once expressed a keen interest in becoming a doctor, but her friends have discouraged her. The teacher of the academically advanced arranges for a successful female doctor to act as a mentor and meet with Justine on a regular basis. Which of the following would be the most appropriate reason for the teacher to choose a mentorship program to promote the continued motivation of this student?
- A. The mentor can help Justine explore other career options that are related to her interests in the medical field.
 - B. Justine could obtain ongoing tutoring help to assist her in completing her schoolwork on time.
 - C. The mentor can provide age appropriate insights to help Justine deal with peer pressure.
 - D. Justine would have a role model to suggest strategies for meeting achievement obstacles.
10. A science teacher of academically advanced middle school students suggests that they participate in a summer program sponsored by a local university to conduct a scientific study of shoreline erosion and its effects on wildlife. Participating in this type of program is particularly beneficial to academically advanced students because they have the opportunity to:
- A. practice previously acquired skills.
 - B. work with professionals to examine a real world problem.
 - C. socialize with intellectual peers.
 - D. experience the structure of higher education coursework.

11. **Read the information below; then complete the exercise that follows.**

You are a fourth-grade teacher in a self-contained classroom. You have a cluster group of five academically advanced students who are working in the sixth-grade math curriculum.

You are teaching an instructional unit based on the "Data Analysis, Statistics, and Probability" strand contained in the *Massachusetts Mathematics Curriculum Framework*. The academically advanced students will be working on learning standards related to calculating probability.

Using your knowledge of mathematics and instruction for academically advanced students, write a response in which you:

- describe two concepts that are important to know about calculating probability, and explain how these concepts are important in developing students' understanding of calculating probability;
- describe how you will provide accelerated instruction on calculating probability for the students in the cluster group; and
- explain why this instruction would be effective with these students.

Answer Key and Sample Response: Academically Advanced (52)

Question Number	Correct Response	Test Objective
1.	D	Understand literature.
2.	B	Understand literature.
3.	D	Understand rhetoric and composition.
4.	A	Understand number theory, algebra, patterns, and functions.
5.	D	Understand geometry, trigonometry, data analysis, probability, and discrete mathematics.
6.	A	Understand geometry, trigonometry, data analysis, probability, and discrete mathematics.
7.	C	Understand reasons, uses, and research evidence for differentiated instructional and grouping practices for academically advanced students.
8.	C	Understand reasons, uses, and research evidence for differentiated instructional and grouping practices for academically advanced students.
9.	D	Understand program options, supplements, and curricular resources for academically advanced students.
10.	B	Understand program options, supplements, and curricular resources for academically advanced students.

Answer Key and Sample Response: Academically Advanced

The sample response below reflects a strong knowledge and understanding of the subject matter.

I would include the cluster group in my general presentation on the topic of probability to the fourth-grade class. I would first introduce the concept of sample space (the set of all possible outcomes) and the concept that each outcome is equally likely. For examples, I would toss a coin, where the sample space is (H, T), and roll a die, with sample space (1, 2, 3, 4, 5, 6). I would then have the entire class perform some experiments in predicting particular outcomes using a die.

Sample space and the equal likelihood of each outcome are important concepts because, once understood, the students can begin to calculate probability. For example, I would ask students to figure out the probability of rolling a 5 with a die. Students could list the sample space and literally count the number of favorable events. In this case, 5 would appear once. The number of favorable events divided by the total number of events equals the probability of the favorable event.

The members of the cluster group should extend their learning about probability to a more advanced level. For instance, I would have them determine the sample space when two dice of different colors are rolled. Students could graphically demonstrate why there are 36 possible outcomes and then explain why. Next, I would have the advanced students design their own experiments using two dice, restricting themselves to outcomes such as the sum of seven, or pairs—a subset of the sample space. Students would calculate the probability of the favorable outcome, roll the dice repeatedly, record the results, and compare the results with their calculations.

This instruction would be effective with academically advanced students because it allows them to apply their knowledge to an experimental question that they have formulated themselves. These students would have the opportunity to study the topic of probability more in depth and then demonstrate their understanding of the advanced content through problem solving.