APPENDIX (A)(3) – A

EXAMPLE ITEM TYPES:
ENGLISH LANGUAGE ARTS/LITERACY AND MATHEMATICS

APPENDIX A3-A:
EXAMPLES OF PROPOSED ITEM TYPES

The Partnership proposes a sophisticated summative assessment system that incorporates four features designed to significantly improve the quality and usefulness of large-scale assessments: the system will be anchored in college and career readiness; performance tasks and computer-enhanced items will enable measurement of the full range of knowledge and skills necessary to succeed in college and 21st century careers; a distributed structure will enable learning to be measured throughout the school year; and technology will enable timely reporting of results. The Partnership's summative assessment system will consist of four components distributed throughout the year in English language arts/literacy, three components distributed throughout the year in mathematics, and one end-of-year component in each subject area. Overall, the assessment system will include a mix of constructed response items; performance tasks; and computer-enhanced, computer-scored items – all of which will be tightly aligned to the Common Core State Standards (CCSS).

Appendix A3-A provides a general description of the items and tasks within the various components and includes samples drawn from a variety of sources, including current state and country assessments, as well as the CCSS themselves. These samples were selected to show the kind of deep analytic thinking students should engage in if they are to meet the CCSS and be prepared for college and careers. In addition, a number of computer-enhanced items are included to highlight, to the extent possible at the current time, the ways that innovative, computer-based item types can be used in selected response formats. In general, the provided examples are aligned to high school level standards; however, the computer-enhanced items tend to be more appropriate for students at lower grades (and may not be well aligned to the standards).

All of these items are meant to serve as examples only, with the expectation that through the research and development process, the Partnership will create varied and complex item types for all grades and all components that align to the CCSS and engage students at all performance levels. Further, the innovations cited below are not meant to be exhaustive, nor can they reflect future potential innovation. The Partnership intends to invest heavily in prototyping and testing innovative items during the assessment design and item development process with the hope that,

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when operational in 2014-15, the assessment will be considerably more innovative and cutting edge than current tests.

ENGLISH LANGUAGE ARTS/LITERACY EXAMPLES

ELA-1 and ELA-2 Through-Course: Focused Literacy

These through-course components are designed to measure the most fundamental capacity essential to achieving college and career readiness according to the CCSS: the ability to read increasingly complex texts, glean evidence from them, draw logical conclusions, and present analyses in writing. The through-course assessments offer opportunities early in the school year to signal whether students are on track. Each through-course component will likely include up to two extended constructed response items of the following type. These items will be enhanced with a computer-based platform that allows the student to prepare an outline and capture notes as they write their essay.

Examples of Extended Constructed Response Items

Example #1:

Delineate and evaluate the argument that Thomas Paine makes in Common Sense. Assess the reasoning present in his analysis, including the premises and purposes of his essay.

> *CCSS Match: 11-12.RI.8*
>
> *Source: CCSS Appendix B: Text Exemplars and Sample Performance Tasks*

Example #2:

Analyze how Abraham Lincoln in his "Second Inaugural Address" examines the ideas that led to the Civil War, paying particular attention to the order in which the points are made, how Lincoln introduces and develops his points, and the connections that are drawn among them.

> *CCSS Match: 9-10.RI.3and 9-10.RI.9*
>
> *Source: CCSS Appendix B: Text Exemplars and Sample Performance Tasks*

Example #3:

Compare two or more recorded or live productions of Arthur Miller's Death of a Salesman to the written text, evaluating how each version interprets the source text and debating which aspects of the enacted interpretations of the play best capture a particular character, scene, or theme.

> *CCSS Match: 11-12.RL.7*
>
> *Source: CCSS Appendix B: Text Exemplars and Sample Performance Tasks*

Example #4:

Cite strong and thorough textual evidence from John Keats's "Ode on a Grecian Urn" to support an analysis of what the poem says explicitly about the urn as well as what can be inferred about the urn from evidence in the poem. Based on a close reading, draw inferences from the text regarding what meanings the figures decorating the urn convey as well as noting where the poem leaves matters about the urn and its decoration uncertain.

> *CCSS Match: 11-12.RL.1*
>
> *Source: CCSS Appendix B: Text Exemplars and Sample Performance Tasks*

Example #5

Analyze the concept of mass based on a close reading of Gordon Kane's "The Mysteries of Mass" and cite specific textual evidence from the text to answer the question of why elementary particles have mass at all. Students explain important distinctions the author makes regarding the Higgs field and the Higgs boson and their relationship to the concept of mass.

> *CCSS Match: 11-12.RST.1*
>
> *Source: CCSS Appendix B: Text Exemplars and Sample Performance Tasks*

ELA-3 Through-Course: Extended Writing/Research

In the examples below, students will be asked to select and read a variety of materials and compose a written essay based on the relevant information over several sessions. These extended performance tasks will be controlled research projects that take advantage of advances in testing technologies to provide students will the materials they need, including multi-media materials. For example, the task might be built to include a searchable environment (i.e., an online "library") in which students locate, evaluate, and select from a set of pre-defined sources, which are of various complexity and relevance to the task (including some that might be irrelevant).

The complexity of the task will in part depend on the extent to which the materials are obviously pertinent to the task or require students to discriminate among them.

Examples of Performance Tasks

Example Topic #1: Science/Technical Texts

Sample Task A: Evaluating evidence. Compare what the latest science tells us about Genetically Modified food against the arguments offered for and against Genetically Modified food. Evaluate the hypotheses, data, analysis, and conclusions of each side, including determining the extent to which each side in the debate over Genetically Modified food relies on the available science, argues from an economic perspective or appeals to political and emotional concerns. Verify the data from each author and corroborate or challenge the conclusions with other sources of information.

> *CCSS Match: 11-12.RST.8*
> *Source: Achieve*

Sample Task B: Making a claim. Read and view different examples of case-making materials related to the GM food debate. Take a position and cite specific textual evidence from your sources, attending to important distinctions each author makes and to any gaps or inconsistencies in the account. Defend your conclusion from counter-claims. Create a presentation of your analysis that highlights key evidence and your strongest claims.

> *CCSS Match: 11-12.RST.1 and 11-12.RST.9*
> *Source: Achieve*

Example Topic #2: Literature: Drama

"In plays, no one arrives on or leaves from the stage without contributing in some way to the complexity of the play." Consider the author's choices of how to have characters enter or exit in the section of the play offered here as well as in scenes from two other plays you have studied and compare the significance and impact of arrivals and departures from the stage.

This example requires students to draw on the play that they are given for the exam as well as their broader knowledge of drama.

Example Topic #3: History/Social Studies Texts

Sample Task A: Analysis of Primary Documents[1] Related to the Major Events Leading to the Civil War. Integrate information from a diverse selection of primary documents into a coherent understanding of the key events that lead to the American Civil war. For example, documents could include the following: the Missouri Compromise (1820), the Nullification Crisis (1832), the Compromise of 1850 (1850), the Kansas-Nebraska Act (1854), Charles Sumner Attacked (1856), the Dred Scott Decision (1857), the Lincoln-Douglas Debates (1858), the John Brown Raid (1859) and the Election of Abraham Lincoln (1860).

> *CCSS Match: 11-12.RH.9*
>
> *Source: Achieve*

Sample Task B. Analysis of secondary sources. Integrate and evaluate at least three historical interpretations of the events leading to the Civil War in order to answer the following questions: was the Civil War inevitable? Why did the War break out in 1861, rather than decades earlier or later (or did the compromises of 1820 and 1850 maintain the peace or simply delay the war)? How were the North and the South different and how did these differences shape events of the mid 19th Century? Cite specific textual evidence to support your analysis.

> *CCSS Match: 11-12.RH.1 and 11-12.RH.7*
>
> *Source: Achieve*

ELA-4: End-of-year

The end-of-year component will build on high-quality, authentic texts at the appropriate level of complexity; meaningful distractors for any selected response developed by content experts; and computer-enhanced items such as ones enabling students to view or listen to digital media. The assessment will draw on higher-order skills such as critical thinking and analysis; measure comprehension, language use and vocabulary; be designed to tap deeper into student depth of

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[1] Sources could include books, magazines, newspapers, some government documents, reports, advertisements, maps, pamphlets, posters, laws, and court decisions. Ideas for this item came from model curriculum and assessment items published by Massachusetts (http://www.sec.state.ma.us/mus/muspdf/cwcurriculum.pdf).

knowledge; and use digital technologies to assess hard-to-measure skills (for example, by asking students to listen to a poem or a scene from a play).

The examples below are divided into two sections. **Section A** includes examples from the New York State Regents Exam and from the Massachusetts Comprehensive Assessment System that provide models of existing selected response items that require some analytic thinking. Both examples include a text and a series of selected response items. **Section B** includes models of current innovative computer-based features that could be used to enhance items in Section A. We approach the discussion of selected response items in this way since current item design is generally not sophisticated enough to capture the full range of innovative items that the Partnership envisions.

While the items in **Section A** align with the content and performance expectations of the CCSS at the high school level, the innovative computer-based features in **Section B** address less advanced content. The Partnership includes the computer-based features to illustrate how technology offers the opportunity for rich item development aligned with the vision for the PARCC assessment system.

SECTION A: Examples of Selected Response Items from NYS Regents Exam & MCAS

Example #1

Text

When teacher Jeremy Gypton was reviewing the Civil War material for his American history class at Empire High School in Vail, Arizona, he found something he'd never read before, even though he has a degree in history: the complete Constitution of the Confederate States of America.

A traditional textbook might have made a passing reference to the document. But there are no textbooks at Empire.... When Empire High School opened in July of last year [2005], students weren't issued backpack-breaking stacks of textbooks. They were handed an Apple iBook with a wireless Internet connection, because the school eschews textbooks in favor of laptops and electronic content.
In science class, they don't just discuss cell division. They go online and watch it in real time. In Michael Frank's first-year biology class, students access their lab instructions, then organize data and graph the results of their work. Later, they will correlate the data from the experiment in a PowerPoint presentation. In Melinda Jensen's honors math class, students went online to learn about game theory when two game-theory researchers won the Nobel Prize in economics. "It was a great class discussion. You can't do that in a regular classroom," Jensen notes. "It would have been something you had to plan ahead of time."

Plenty of schools have instituted pilot programs using laptops to supplement their traditional curriculum. But Empire is one of very few in the country — perhaps the only school — that has eliminated textbooks almost entirely in grades nine through 12.

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"The key to making this work is not having the textbooks," says Calvin Baker, superintendent of the Vail Unified School District. "You walk in any of the classrooms in this school and it's a different feel, different from a textbook school, different from a school where kids just happen to have laptops so they're doing their homework on laptops, but sometimes they use them and sometimes they don't."

"Laptops are part of the fabric of everything that goes on at Empire. That's the way it should be," he adds. "We all use laptops to gather information, store information, and distribute information. That's the way the world turns now."

Of course, there are downsides. The computers crash. A few weeks into the project, students hacked the filters that had prevented them from going to forbidden places online, though security was soon restored. Some tried to get away with playing games during work time. That didn't last long; teachers can view what's on any student's screen at any moment and virtually reach out and throw games in the desktop trash.

"The laptops don't change human nature," Baker says. "Students are always going to be testing limits."

For teachers, it's a matter of monitoring and keeping control, just as always. "It comes down to teaching skills and classroom management," says Matt Donaldson, an assistant principal and math teacher. "Whether you're using computers or a notebook, if the teacher is on top of what's going on in the classroom, you aren't going to have those problems."

Mark Schneiderman, director of education policy for the Software & Information Industry Association, a Washington, D.C.-based trade association, says the most recent survey, two years ago, indicated that about 600 school districts nationwide had pilot programs supplying laptops to individual students. Henrico County Public Schools in Virginia began using laptops for 23,000 middle and high school students in 2001. The state of Maine opened an ambitious program to supply more than 30,000 students in 243 middle schools with laptops in January 2002. Legislators later expanded the program to about a third of the state's high school students. But in those schools and others, laptops are used in tandem1 with old-fashioned textbooks.

"My sense is that the situation in the Vail school is relatively unique," Schneiderman says. "There may be a few other, smaller such efforts under way, but it's pretty unique."

That's just what school officials intended when they began planning a new school to alleviate overcrowding in the district. They were already aggressively using technology, linking schools with a wireless system and showing grades and attendance online in real time. They visited a laptop high school in the California Bay Area and talked to Apple about the resources available.

"There was no question students at the laptop school were more engaged," Baker says. "But we were confident we could do it better."

The schools the Empire planning team visited were using laptops as frosting, as another layer to traditional instruction. "It wasn't fundamentally changing the structure of what was happening in classrooms, so we had the idea that if you really wanted to change what was happening in school, you had to take away textbooks," Baker says.

Empire was a new school without old textbooks. So they simply didn't order any. Making it easier and logical to move away from textbooks, Baker adds, is the national trend of teaching to standards. No longer do teachers start at the beginning of a textbook, make sure they're halfway through by Christmas, and then race through the Vietnam War in May. Even if they use textbooks, they jump back and forth, extracting what they need to meet the standard....

"One of our teachers expressed it well," Baker says. "She said, 'The way I explain it to friends is the difference between teaching in a traditional high school and Empire is the difference between swimming in a pool and swimming in the ocean.' "

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Students can go as deep as they want into material. "Books can be very limiting," Jensen says. "It's very interesting to work without the boundaries that are created by a book."

Striding outside those boundaries also means students have to evaluate the material they find, something Gypton thinks provides more teaching moments. "I've come to realize that critical thinking may not be a natural thing," Gypton says. "It is a skill that has to be taught. It has to be developed. And you can't develop critical thinking if your material is shallow and only painted in broad brush strokes."

They also didn't anticipate how clueless students were about using the technology. They may know about video games and myspace.com, but the notion that middle school and high school students are digital experts is overstated, Gypton says.

"It's bunk," he says. "I had kids for three or four weeks who didn't know how to work Microsoft Word. When they'd save something they'd look at me with this sad look in their eyes and say, 'Where did it go?'"

Paper does show up, though rarely. Jensen has her students do math problems on paper. And her honors class wanted textbooks so they could work ahead....

It's too early to gauge the effect on learning at Empire. But a study of Maine's laptop initiative by the Maine Education Policy Research Institute at the University of Southern Maine concluded there were numerous advantages. Among them:

- More than four out of five teachers reported students were more engaged in learning.
- More than 70 percent of teachers reported that the laptops more effectively helped them meet curriculum goals and individualize curriculums.
- Students who took the laptops home were more likely to complete class work.
- Students who no longer had laptops reported getting less work done.

At Empire, students like using laptops, though they chafe2 at the restrictions placed on them — filtering software prevents instant messaging, the teens' communication choice these days, even when they're using the laptop at home. "A lot of people think we should have fewer restrictions when we're at home," says Jason Ash, a 15-year-old sophomore. Ash says he's more organized because everything from assignments to grades is in one place online.

Brad Morse, a 17-year-old junior, liked the fact he could go online and view more illustrations when his class was studying the Continental Congress. "If I don't understand something, I can go on Google and look it up and learn more," he says.
That's typical, Jensen says. "Students come in all the time with websites where they've found helpful resources about what we're learning. It really creates a feeling of community."

Morse and others admit they were initially easily distracted, sometimes using e-mail and playing games during class in the first few weeks. But the school put a stop to that. "Now they have all the teachers monitor us so we're not as easily distracted," says Ashley Coulter, a 15-year-old sophomore.

Jensen, in her fourth year of teaching, is energized daily. "I feel like the kids here are so interesting and so creative and so much fun that every day I look forward to seeing them," she says. "I don't know if they're more interesting because they're more engaged or if we got students who were more willing to think outside the box."

—Jim Morrison [excerpted from "Ending the Paper Chase" -- *Southwest Airlines Spirit*, May 2006]

Percentage of children in nursery school and students in grades K-12 using the Internet for specific activities, by sex and grade level: 2003							
	Sex			Grade level			
Internet activity	All Students Percent	Female Percent	Male Percent	Nursery School Percent	Kindergarten Percent	Grade 1-5 Percent	Grade 6-8 Percent	Grade 9-12 Percent
Completing school assignments	46	48	45	7	10	31	61	73
E-mail or instant messaging	36	39	33	6	8	19	46	64
Playing games	38	37	39	15	21	32	47	49
News/weather/sports	21	20	23	2	4	10	26	41
Find information on products	21	20	22	3	4	9	24	42
Watch/listen to TV, movies, or radio	13	13	13	2	4	6	15	24
Make purchases	8	7	9	1	1	3	7	19
Phone calls	1	1	1	#	1	1	1	2
Taking a course online	1	1	1	#	#	1	1	3
Find government information[1]	—	—	—	—	—	—	—	13
Find health information[2]	—	—	—	—	—	—	3.6	9
Find a job[2]	—	—	—	—	—	—	—	6
Online banking[2]	—	—	—	—	—	—	—	4
Trading stocks[2]	—	—	—	—	—	—	—	1

— Not available. Data were not collected.

Rounds to zero.

[1] Questions about noted activities were asked only about persons age 15 and older. Estimates for these activities are for students in grades 9 through 12 who are age 15 or older.

[2] Questions about noted activities were asked only about persons age 12 and older. Estimates for these activities are for students in grades 6 through 12 who are age 12 or older.

Source: (adapted) U.S. Census Bureau, "Current Population Survey," October 2003 and National Center for Education Statistics, "Computer and Internet Use by Students in 2003," September 2006

Multiple-Choice Questions

7. As used in line 9, the word "eschews" most nearly means

    (1) reduces

    (2) arranges

    (3) censors

    (4) rejects

8. Empire is different from other high schools in the country because Empire

    (1) has eliminated almost all textbooks

    (2) uses only classroom discussion

    (3) follows a traditional curriculum

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(4) has expanded testing

9. Some early problems with Empire's laptop program were a result of

    (1) inadvertent training errors

    (2) inadequate technical support

    (3) inappropriate computer use

    (4) insufficient budget allocations

10. According to Matt Donaldson (lines 41 through 44), effective use of computers in the classroom is directly related to a teacher's

    (1) knowledge of technology

    (2) skill in supervising students

    (3) ability to evaluate students

    (4) willingness to experiment

11. According to the text, what did Empire hope to achieve with its policy regarding textbooks and laptops?

    (1) increase in textbook use

    (2) improvement of test scores

    (3) uniformity of teaching standards

    (4) changes in instructional techniques

12. When Empire started its laptop program, the computer skills of many students were limited to

    (1) creating documents

    (2) playing games

    (3) watching videos

    (4) shopping online

13. A conclusion that could be drawn from Maine's "laptop initiative" is that teachers

    (1) found the software troublesome

    (2) preferred using textbooks

    (3) achieved their teaching goals

    (4) paid for computer distribution

14. According to the table, what is one Internet activity that is lower for males than females?

(1) using e-mail

(2) reading news

(3) researching products

(4) making purchases

15. The table indicates that children in grades 1 through 5 spend most of their Internet time

    (1) doing homework

    (2) playing games

    (3) watching the news

    (4) listening to music

16. According to the table, the greatest percentage of students who use the Internet for schoolwork are those in

    (1) kindergarten

    (2) grades 1–5

    (3) grades 6–8

    (4) grades 9–12

CCSS Match: *9-10.RI.2, 9-10.RI.4, and 9-10. RI.6*

Source: *The University of the State of New York Regents High School Examination Comprehensive Examination in English (Session One)*

Example #2

Read the opening of Russell Banks's novel Continental Drift *and answer the questions that follow.*

From CONTINENTAL DRIFT
by Russell Banks

It's December 21, 1979, a Friday, in Catamount, New Hampshire. It's late in the day, windless and cold, bits of snow dropping from a dark, low sky. At this latitude at this time of year, the sun sets at three forty-five, and Catamount, a river town laid north and south between a pair of glacial moraines, settles quickly without twilight into darkness. Light simply gets replaced by cold, and the rest remains the same.

A half foot of old crusty snow has covered the ground since the first week of the month, followed by days and nights of dry cold, so that the snow has merely aged, turning slowly gray in yards and on rooftops and in heaps alongside the streets, pitted and spotted along sidewalks and pathways by dogs and mottled everywhere with candy wrappers, beer cans and crumpled cigarette packs. The parking

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lots and sidewalks, plowed and salted weeks ago, are the color of ash, so that new snow gently falling comes as a cleansing fresh coat of paint, a whitewash that hides the old, stained and tainted world underneath.

Robert Raymond Dubois (pronounced locally as "Doo-boys"), an oil burner repairman for the Abenaki Oil Company, walks slowly from the squat, dark brick garage where he has parked the company truck, walks hunched over with careful effort, like a man in a blizzard, though snow is falling lightly and there is no wind. He wears a dark blue trooper coat with a fur collar, and a black watchcap. In one hand he carries a black lunchbox, in the other an envelope containing his weekly paycheck, one hundred thirty-seven dollars and forty-four cents.

Dubois thinks, A man reaches thirty, and he works at a trade for eight years for the same company, even goes to oil burner school nights for a year, and he stays honest, he doesn't sneak copper tubing or tools into his car at night, he doesn't put in for time he didn't work, he doesn't drink on the job—*a man does his work*, does it for eight long years, and for that he gets to take home to his wife and two kids a weekly paycheck for one hundred thirty-seven dollars and forty-four cents. Dirt money. Chump change. Money gone before it's got. No money at all. Bob does not think it, but he knows that soon the man stops smiling so easily, and when he does smile, it's close to a sneer. And what he once was grateful for, a job, a wife, kids, a house, he comes to regard as a burden, a weight that pulls his chin slowly to his chest, and because he was grateful once, he feels foolish now, cheated somehow by himself.

- *Continental Drift* by Russell Banks. Copyright © 1985 by Russell Banks. Reprinted by permission of HarperCollins Publishers.

Reading Comprehension

Read the description from paragraph 2 in the box below.

…the snow has merely aged, turning slowly gray in yards and on rooftops and in heaps alongside the streets, pitted and spotted along sidewalks and pathways by dogs and mottled everywhere…

9. What does the aging snow **most likely** reflect?

A. the needs of Dubois's family

B. the peacefulness of the town

C. the deterioration of Dubois's life

D. the irresponsibility of the townspeople

10. In paragraphs 3 and 4, what is the **most likely** reason the exact amount of Dubois's paycheck is spelled out?

A. to show how hard he works

B. to emphasize his wife's excitement

C. to show the amount of money repairmen make

D. to emphasize the insignificance of the amount

11. Read the sentence fragments from paragraph 4 in the box below.

Dirt money. Chump change. Money gone before it's got. No money at all.

What is the effect of the fragments?

A. They emphasize Dubois's fears.

B. They emphasize Dubois's greed.

C. They emphasize Dubois's disgust.

D. They emphasize Dubois's confusion.

12. Based on the excerpt, what is Dubois's **main** frustration?

A. He lives in a town that provides little opportunity.

B. He has a family and friends that demand too much of him.

C. His hard work and honesty have earned him nothing.

D. His coworkers have found success through cheating.

13. What shift in focus occurs from paragraph 1 to paragraph 4 of the excerpt?

A. from the past to the present

B. from one setting to another

C. from Dubois's feelings to his family's feelings

D. from external description to Dubois's thoughts

CCSS Match: *9-10.RL.1 and 9-10. RL.4*

Source: *MCAS, English Language Arts, Grade 10, Reading Comprehension*

SECTION B: Examples of Innovative Items

The innovative items below are meant primarily as samples of innovative items types, not as models of specific content in the CCSS. While they are matched to specific standards, they have not yet been designed as measures for those standards. The items below show many ways that computers could allow innovative assessments of literacy in ways that could be further adapted to the specific demands of the CCSI.

Example #1

Drag-and-Drop Example 2

The two passages below give different opinions about making gambling legal. Read each passage and think about the similarities and differences between the two opinions. Using your mouse, click on one sentence from each paragraph that illustrates how the two opinions differ, and drag each sentence into the "Difference" box. Then, click and drag one sentence from each paragraph that shows how the two opinions are similar, and place them in the "Similar" box.

Passage 1	Passage 2
The easiest way for states to raise money during these difficult times is to legalize gambling. Casinos and slot machines are fast and low-resource means for generating state tax revenue. The tax money brought in by these games of chance can be used to fix roads, fund local education, and feed the poor. Clearly, gambling should be legalized to help our struggling communities during these difficult economic times.	If we want to ruin our communities, clearly, we should legalize gambling. Sure, gambling raises money for states. However, studies have shown that gambling leads to increased alcoholism and prostitution within and around the communities in which casinos and slot machines are set up. Moreover, gambling has ruined the lives of many "gamers" who just could not quit. Gambling addicts have lost their family fortunes by spending everything in pursuit of the "next sure win." I can think of no reason that justifies the legalization of gambling.

Difference		Similar	
Passage 1	Passage 2	Passage 1	Passage 2
Clearly, gambling should be legalized to help our struggling communities during these difficult economic times.	I can think of no reason that justifies the legalization of gambling.	The easiest way for states to raise money during these difficult times is to legalize gambling.	Sure, gambling raises money for states.

Note: More than one correct answer exists for the difference task. The scoring key would allow for all possible correct pairings.

CCSS Match: 3.RI.9

Source: "Sample Innovative Items for Assessing Skills in Math and English Language Arts" from Sireci Psychometric Services (May 28, 2010)

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Example #2

IV. Editing Item Format

Read the paragraph below. Then, using the keyboard, correct all spelling errors you find, including capitalization errors. Some words may be misspelled because of how they are used in a sentence. Therefore, you should also consider word usage in identifying errors in the paragraph.

My favorite sport is soccer. Some peple call soccer football, but in America we call it soccer. It is fun because you have to run alot. I love to run cause I am very fast. My coach likes to play me in the foreward position, and he likes to play me the whole game. I like it twoi If you want to make me happy, just put me in a soccer game.

Key:

My favorite sport is soccer. Some **people** call soccer football, but in America we call it soccer. It is fun because you have to run a lot. I love to run because I am very fast. My coach likes to play me in the forward position, and he likes to play me the whole game. I like it too! If you want to make me happy, just put me in a soccer game.

Potential Benchmarks Measured. (a) Use correct standard English; (b) Spell commonly used homophones correctly

CCSS Match: 3.L.2.e and 3.L.2.f

Source: *"Sample Innovative Items for Assessing Skills in Math and English Language Arts" from Sireci Psychometric Services (May 28, 2010)*

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Example #3

I. Picture Arrangement Item Format

Item 1 refers to the passage below. Read the passage and then complete item 1.

My Trip to Greece

Last week, I boarded a plane to go to Greece! I was so excited. My grandparents live there. They met me at the airport. Then, they took me to their house by the beach. After a fantastic meal and a good night's sleep, my dream came true. We went to the Acropolis, which means "High City." There, I saw the Parthenon, which is all that remains of a famous temple built over 2,000 years ago. I had a great time in Greece. I was sad to leave.

The pictures below show different parts of the story you just read. Place the pictures in the order in which they happened in the story. Click on each picture and drag it to one of the boxes below to arrange them in the correct order. When the pictures are in the correct order, click on "Finished." If you need to change the order, click on "Start Over."
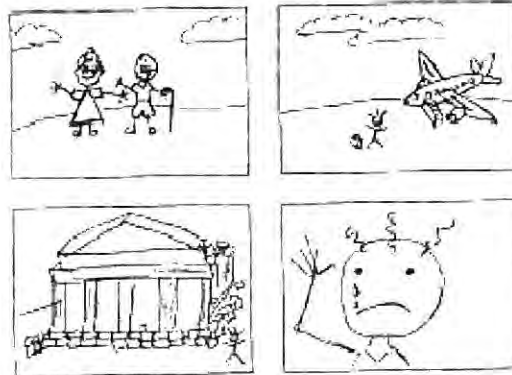
| 1 | 2 | 3 | 4 |

CCSS Match: 2.RL.2

Source: *"Sample Innovative Items for Assessing Skills in Math and English Language Arts" from Sireci Psychometric Services (May 28, 2010)*

Example #4

II. Highlighting Text Item Format

Highlight the word in the passage that refers to a famous temple. Use the highlighting tool to click on the word and highlight it.

My Trip to Greece

Last week, I boarded a plane to go to Greece! I was so excited. My grandparents live there. They met me at the airport. Then, they took me to their house by the beach. After a fantastic meal and a good night's sleep, my dream came true. We went to the Acropolis, which means "High City." There, I saw the Parthenon, which is all that remains of a famous temple built over 2,000 years ago. I had a great time in Greece. I was sad to leave.

CCSS Match: 3.RL.4

Source: *"Sample Innovative Items for Assessing Skills in Math and English Language Arts" from Sireci Psychometric Services (May 28, 2010)*

Example #5

Highlighting Text Example 2

Read the passage below and answer the two items that follow.

Remembering Tommy

I have recently had a loss. A good friend of mine died just before Christmas.

My friend Tommy had cerebral palsy and knew it as imprisonment. He spent twenty two years completely speechless. The only sound he made came from a congested throat once treated with a tracheotomy. His best means for communication was rolling his eyes upward to indicate the word "yes." His posture in his wheelchair always needed to be restricted and defined in some way. Physical barriers made it difficult for Tommy to type his thoughts, to expand on them, to build new ones. The people who loved him knew his devotion to the Baltimore Orioles, his love for his parents and family and his home, his wishes to do well in school. Yet all the words that were ever said were somebody else's, never his own.

Tommy fought a never-ending battle with his involuntary movements. He had to struggle to sit still. Any intentional gesture would bring with it, its own wake of extraneous motions, motions that Tommy never really needed. Tommy would never have died of depression. For he had joy, faith, and wisdom to see true life beyond imprisonment. But he died of cardiac arrest. Now all of his movements and leg cramps have ended. I will always remember my friend as a tremendous sign that the soul is eternally more vital than the body.

©1985 Paul Peroutka

1) Highlight one sentence in the passage the author uses to suggest Tommy had a happy life?

2) Highlight one word in the passage that should be hyphenated.

CCSS Match: 6.RL.1, 6.L.2.a, and 6.L.2.b

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ELA-5 Through-course: Speaking and Listening

For this component, students will be expected to present their analysis and findings from the research conducted for the through-course ELA-3, include multimedia elements as appropriate, and engage in discussion with or answer questions from their classmates and/or teacher. The speaking and listening component will be required but will not be included as part of a student's summative score. The Partnership will develop common rubrics to capture the full range of student performance for teachers to use to evaluate students' speaking skills. Example #1 below is adapted from the guidelines for the New York City Senior Circle Panel presentations. As is the case with all of the items provided in this Appendix, the Partnership will continue to explore innovations in how to best measure speaking and listening and implement this component.

Example #1

Performance Task Example Topic #1, Sample Task A

Presentation: The student will present his/her research and findings on the topic examined in ELA-3 (e.g. Genetically Modified food from Example Topic #1 above), use evidence to support his/her claim(s), and utilize of digital media as appropriate. For example, the student might provide a summary of his/her findings; explain why he/she is either for or against the researched topic, citing evidence from specific articles and research material; and present a visual graphic of data or a compelling video that supports his/her argument.

Clarifying Questions and Collaborative Discussions: The audience (the teacher and classroom) may ask the student to clarify any points that may have been vague or confusing during the presentation or ask the student questions to test the depth of the student's mastery of relevant skills and content. For example, the student might be asked about the opposing side of the argument or to clarify a piece of data from the presentation.

Rubric: Although the Partnership will create rubrics during the development process, during the presentation, students should communicate a clear understanding of his or her ideas and argument, present information logically and concisely, and demonstrate command of formal

English. In addition, the student should answer questions accurately, thoughtfully, and effectively while engaging in thoughtful discourse about their presentation topic with his or her peers.

CCSS Match: 9-10.SL.1C, 9-10.SL.4, and 9-10.SL.6
Source: New York City Department of Education, Guidelines for Senior Circle Panel Presentations

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MATHEMATICS EXAMPLES

Math-1 and Math-2: Focused Assessments of Essential Topics

The first two through-course components will emphasize standards or clusters of standards from the CCSS that are considered mathematical building blocks for instruction over the school year. Each component will likely be a blend of brief constructed response and extended constructed response items. The example items below highlight the content knowledge and performances expected of students; they should not be considered definitive representations of the cluster/essential topic for any particular through-course component, as these will be identified through the standards unpacking process referenced in (A)(4). The Partnership will explore how technology can enhance these traditional item types.

Examples of Brief Constructed Response Items

Example #1

1. *[Maximum mark: 16]*

   Let S_n be the sum of the first n terms of the arithmetic series $2 + 4 + 6 + \ldots$

   (a) Find

       (i) S_4;

       (ii) S_{100}.

   Let $M = \begin{pmatrix} 1 & 2 \\ 0 & 1 \end{pmatrix}$

   (b) (i)   Find M^2.

       (ii) Show that $M^3 = \begin{pmatrix} 1 & 6 \\ 0 & 1 \end{pmatrix}$.

   It may now be assumed that $M^n = \begin{pmatrix} 1 & 2n \\ 0 & 1 \end{pmatrix}$, for $n \geq 4$. The sum T_n is defined by

   $$T_n = M^1 + M^2 + M^3 + \ldots + M^n.$$

   (c) (i)   Write down M^4.

       (ii) Find T_4.

   (d) Using your results from part (a)(ii), find T_{100}.

CCSS Match: N.VM.7 (b & c) AND N.VM.8 (c) (no CCSS match for a or d)

Example #2

2. [Maximum mark: 18]

Consider the functions f and g where $f(x) = 3x - 5$ and $g(x) = x - 2$.

(a) Find the inverse function, f^{-1}.

(b) Given that $g^{-1}(x) = x + 2$, find $(g^{-1} \circ f)(x)$.

(c) Given also that $(f^{-1} \circ g)(x) = \dfrac{x+3}{3}$, solve $(f^{-1} \circ g)(x) = (g^{-1} \circ f)(x)$.

Let $h(x) = \dfrac{f(x)}{g(x)}$, $x \neq 2$.

(d) (i) Sketch the graph of h for $-3 \leq x \leq 7$ and $-2 \leq y \leq 8$, including any asymptotes.

(ii) Write down the equations of the asymptotes.

CCSS Match: F.BF.4a (a), F.BF.1c (b &c), and F.IF.7d (d)

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Example #3
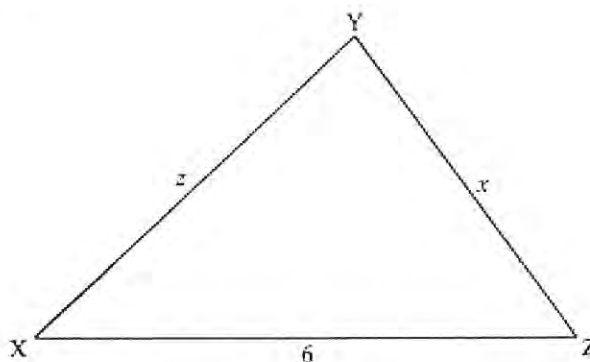
CCSS Match: *A.REI.4a (a & e), A.SSE.3b (a & e), Mathematical Practice 3 (a), A.REI.3 (b), A.CED.2 (b), G.SRT.10 (b), G.SRT.9 (c), A.REI.1 (c & e), Mathematical Practice 6 (c), F.TF.8 (d), Mathematical Practice 7(d), and A.REI.4B (e)*

Source: *International Baccalaureate Diploma Programme – Mathematics – Standard Level – Paper 2 [May 2006]*

Example #4

5.   *[Maximum mark: 19]*

The following diagram shows a solid figure ABCDEFGH. Each of the six faces is a parallelogram.
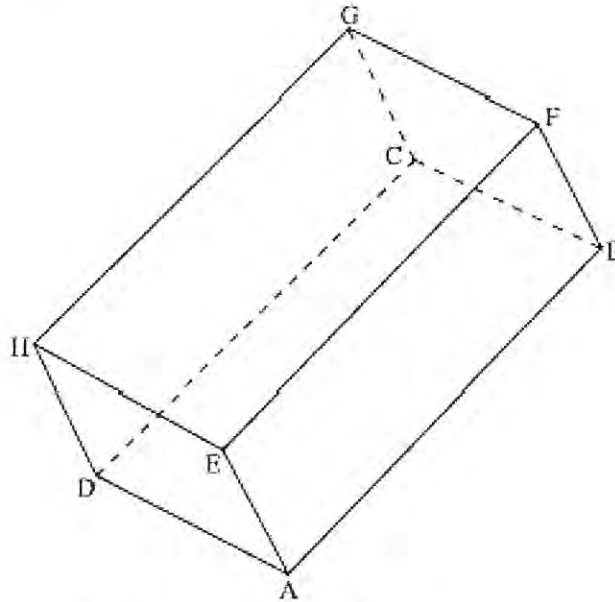
The coordinates of A and B are $A(7, -3, -5)$, $B(17, 2, 5)$.

(a)   Find

(i) $\vec{AB}$;

(ii) $\left|\vec{AB}\right|$.

CCSS Match: N.VM.1

Source: International Baccalaureate Diploma Programme – Mathematics – Standard Level – Paper 2 [May 2006]

Examples of Extended Constructed Response Items

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Example #1

The Federal Communications Commission (FCC) needs to assign radio frequencies to seven new radio stations located on the grid in the accompanying figure. Such assignments are based on several considerations including the possibility of creating interference by assigning the same frequency to stations that are too close together. In this simplified situation it is assumed that broadcasts from two stations located within 200 miles of each other will create interference if they broadcast on the same frequency, whereas stations more than 200 miles apart can use the same frequency to broadcast without causing interference with each other. The FCC wants to determine the smallest number of frequencies that can be assigned to the six stations without creating interference.

1 unit = 50 miles
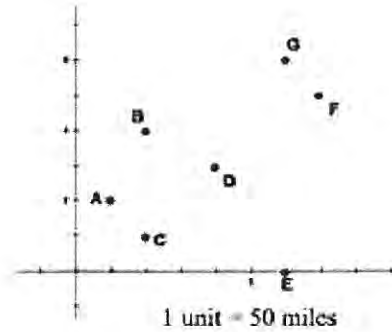
Figure 2

- Student 1 began thinking about the problem by drawing a circle of radius 200 miles centered on each radio station.
- Student 2 began thinking about the problem by drawing line segments to connect pairs of radio stations whenever the two radio stations are within 200 miles of one another.
- Student 3 began thinking about the problem by drawing line segments to connect pairs of radio stations whenever the two radio stations are more than 200 miles from one another.

Which approach seems most promising to you? Use this approach to determine the smallest number of frequencies that can be assigned to the six stations without creating interference. Justify your final answer.

CCSS Match: 7.G.1, 7.G.2, and Mathematical Practices 2 & 3

Source: This item was contributed by Jason Zimba, Professor of Physics and Mathematics, Bennington College; Council of Chief State School Officers, and the National Governors Association – original source unknown.

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Example #2

A recommended adult dosage of the cold medication NoMoreFlu is 16 mL. NoMoreFlu causes drowsiness when there are more than 4 mL in one's system, in which case it is unsafe to drive, operate heavy machinery, etc. The manufacturer wants to print a warning label telling people how long they should wait after taking NoMoreFlu for the drowsiness to pass. The typical metabolic rate is such that one quarter of the NoMoreFlu is lost every four hours.

(a) If a person takes the full dosage, how long should adults wait after taking NoMoreFlu to ensure that there will be
  (i) Less than 4 mL of NoMoreFlu in their system?
  (ii) Less than 1 mL in their system?
  (iii) Less than 0.1 mL in their system?
(b) What do you think the warning label should say? Design the label and explain the thinking behind your design.

CCSS Match: F.LE.1c; F.LE.2 and Mathematical Practices 2, 3 & 6

Source: This item was contributed by Jason Zimba, Professor of Physics and Mathematics, Bennington College; Council of Chief State School Officers, and the National Governors Association – original source unknown.

Example #3

If oil should ever be spilled into the Columbia River Estuary, the company responsible for the spill would be liable for monetary damages according to a formula. By Washington state law, the formula in 2009 was given by:[1]

$$D = 0.508GS(A + B + C)$$

In this formula, D is the damage liability in dollars; G is the number of gallons spilled; S is a "vulnerability score" in the range from 1 to 5 that takes into account the wildlife characteristics of any given square kilometer of the estuary[2]; and A, B and C are "chemical penalty scores" in the range from 1 to 5 that take into account the toxicity, harmful mechanical properties, and longevity of the material spilled. For example, kerosene has a toxicity score $A = 1.4$, a harmful mechanical property score $B = 2.4$, and a longevity score $C = 1$.[3] Suppose that a company responsible for a kerosene spill in an area of lowest vulnerability is held liable for $10 million. How many gallons were spilled? How many dollars per gallon was the company charged for the spill? In general, what is a formula for the number of dollars of liability per gallon of spill? What is the maximum possible liability in dollars per gallon?

CCSS Match: 8.EE.7; A.REI.; A.SSE.1a; A.SSE.1b; and Mathematical Practices 2, 3, & 6

Source: This item was contributed by Jason Zimba, Professor of Physics and Mathematics, Bennington College; Council of Chief State School Officers, and the National Governors Association – original source unknown.

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Math-3: Extended Assessment

This through-course component will meet the demands of the CCSS by using performance tasks that require depth of understanding and the ability to apply mathematics to real world problems. These problems may not be explicitly stated as math problems but rather as problems to which students will need to apply their conceptual understanding of key mathematical concepts in order to solve. The examples below demonstrate the beginnings of the Partnership's thinking on the kinds of contextual problems students will encounter and the mathematical thinking required as part of this component. However, the Partnership expects that the performance tasks developed during this initiative will require far more investigation, evaluation, and synthesis than is shown by the examples below. For this reason, each example includes some insight into how the items might be enhanced to better illustrate the kinds of thinking and performances that students would be asked to demonstrate. In addition, the Partnership will explore how technology can enhance student engagement within each performance tasks.

Examples of Performance Tasks

Example #1

The mathematical concepts in *Example #1* are indicative of the mathematics that might be required in a performance task; however, to further enhance this item, the Partnership might require students to take measurements of actual staircases, wheelchair ramps, etc; record and analyze their results; and make recommendations for building code guidelines. The item would still introduce the algebraic components of the below item and might include a graphing component as well.

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All states have building codes. Many such codes can be interpreted as mathematical inequalities, since they establish limits on what can be done.

Most states have codes related to staircase construction (see the photo).
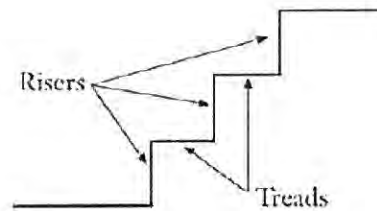

Figure 14   Figure 15

The most basic dimensions of a set of stairs are *riser height* and *tread depth*. A *riser* is the vertical front of a stair. The surface that you step on is called a *tread*. (See the diagram.)

(a) The Massachusetts State Building Code includes this statement:

Maximum riser height shall be seven inches (178 mm) and minimum riser height shall be four inches (102 mm).

This statement contains two requirements for riser height. Write these requirements in two ways: as a pair of simple inequalities, and also as a compound inequality.

(b) Here is another statement from the Massachusetts State Building Code:

Minimum tread depth shall be 11 inches (279 mm), measured horizontally between the vertical planes of the foremost projection of adjacent treads at a right angle to the tread's leading edge.

CCSS Match: 6.EE.8 (a & b), 7.EE.4c, A-REI.10 A-REI.12 (d), and Mathematical Practice 3 & 4 (e)

Source: This item was contributed by Jason Zimba, Professor of Physics and Mathematics, Bennington College; Council of Chief State School Officers, and the National Governors Association – original source unknown.

Example #2

To make Example #2 a more robust task, the Partnership might consider having students gather data (from Kelley Blue Book or other sources, for example) on the depreciated value of a used car of their choosing, graph their data using a scatterplot, analyze their graph and determine the

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line of best fit (linear, quadratic, exponential, etc), and finally answer questions of the kind presented below. The Partnership values the contextual nature of this problem but would use the development period to strengthen this aspect of the performance task.

> Clara purchased a used car for $8400. She estimates that each year she owns the car it will depreciate (lose value) by 12% of its value the previous year.
>
> (a) According to Clara's assumption, the car's value after 1 year from the purchase date will be $7392. Check this yourself.
> (b) What will be the car's value 2, 3, and 4 years from the date of purchase?
> (c) Clara plans to keep the car until its value reaches $4000. By Clara's assumption, what is the minimum number of years from the date of purchase that the car's value will be less than $4000? Show your work.

CCSS Match: F.LE.1.c, F-LE.2, REI.1, and Mathematical Practice 2

Source: This item was contributed by Jason Zimba, Professor of Physics and Mathematics, Bennington College; Council of Chief State School Officers, and the National Governors Association – original source unknown.

Example #3 and #4

Examples #3 and #4 demonstrate the importance that the Partnership places on students finding and analyzing real-world data and recognizing the mathematics required to solve a given problem. However, they do not fully convey the level of student engagement envisioned for PARCC performance tasks. The Partnership plans to develop performance tasks that cover the full modeling cycle by asking students to recognize the mathematics; find, analyze and use data; employ mathematical procedures as appropriate; and explain and/or defend their response.

> Our school has to select a girl for the long jump at the regional championship. Three girls are in contention. We have a school jump-off. Their results, in meters, are given in the accompanying table.
>
> | Elsa | Miki | Aisha |
> |------|------|-------|
> | 3.25 | 3.55 | 3.67 |
> | 3.95 | 3.88 | 3.78 |
> | 4.28 | 3.61 | 3.92 |
> | 2.95 | 3.97 | 3.62 |
> | 3.66 | 3.75 | 3.85 |
> | 3.81 | 3.59 | 3.73 |
>
> Table 3: Data from the jump-off; distances are given in meters.
>
> Hans says, "Aisha has the longest average. She should go to the championship."
> Do you think Hans is right? Explain your reasoning.

> The Trans Alaska Pipeline System is 800 miles long and cost $8 billion to build. Divide one of these numbers by the other. What is the meaning of the answer?

Math-4: End-of-year Assessment

This component will leverage technology to administer innovative, computer-enhanced items that measure the extent to which students have mastered important knowledge and skills. The items for this component will include next-generation selected-response items that not only signal whether students provided a correct answer but also help analyze why some students might have provided an incorrect answer (i.e., by identifying common mathematical errors that suggest common math misunderstandings).

The examples below are divided into two sections. **Section A** includes examples from the New York State Regents Exam that demonstrate a range of existing selected response item types in mathematics. The examples in **Section B** demonstrate current features of innovative computer-based items that could be used to enhance the selected response items in Section A. The Partnership includes the computer-based features to illustrate how technology offers the opportunity for rich item development aligned with the vision for the PARCC assessment system; current item design is generally not sophisticated enough to capture the full range of innovative items that the Partnership envisions.

SECTION A: Examples of Selected Response

Example #1

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8 Students in Ms. Nazzeer's mathematics class tossed a six-sided number cube whose faces are numbered 1 to 6. The results are recorded in the table below.

Result	Frequency
1	3
2	6
3	4
4	6
5	4
6	7

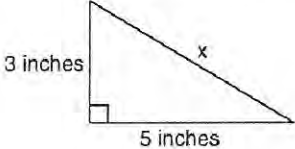Based on these data, what is the empirical probability of tossing a 4?

(1) $\frac{8}{30}$

(3) $\frac{5}{30}$

(2) $\frac{6}{30}$

(4) $\frac{1}{30}$

CCSS Match: 7.SP.6

Source: The University of the State of New York – Regents High School Examination: Integrated Algebra (June 2009)

Example #2

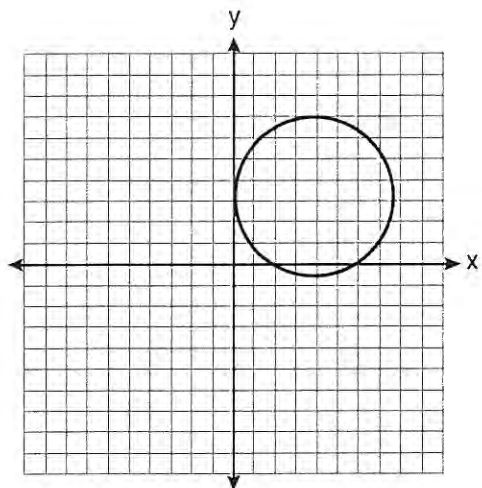9 What is the value of x, in inches, in the right triangle below?

(1) $\sqrt{15}$

(3) $\sqrt{34}$

(2) 8

(4) 4

CCSS Match: 8.G.7

Source: The University of the State of New York – Regents High School Examination: Integrated Algebra (June 2009)

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Example #3

19 Which statement is true about the relation shown on the graph below?

(1) It is a function because there exists one x-coordinate for each y-coordinate.

(2) It is a function because there exists one y-coordinate for each x-coordinate.

(3) It is *not* a function because there are multiple y-values for a given x-value.

(4) It is *not* a function because there are multiple x-values for a given y-value.

CCSS Match: F.IF.1

Source: The University of the State of New York – Regents High School Examination: Integrated Algebra (June 2009)

Example #4

18 What are the vertex and axis of symmetry of the parabola $y = x^2 - 16x + 63$?

(1) vertex: $(8,-1)$; axis of symmetry: $x = 8$

(2) vertex: $(8,1)$; axis of symmetry: $x = 8$

(3) vertex: $(-8,-1)$; axis of symmetry: $x = -8$

(4) vertex: $(-8,1)$; axis of symmetry: $x = -8$

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SECTION B: *Examples of Innovative Items*

Example #1

Graphing Example 2 (Includes Interactive with Database software):

A company wants to create a graph that shows how profits have changed from the year 2000 to the year 2010. The profits for each year are contained in an Excel file that appears below.

a) Use the chart editor to the left of the Excel file to create the graph. The data from the Excel file can be placed into the chart by double clicking on any column and dragging it to the vertical or horizontal axis in the chart editor. When you are finished, click on "create graph." If you need to redo the graph, click on "start over." When you are satisfied with your graph, click "finish."

Excel File   Chart Editor

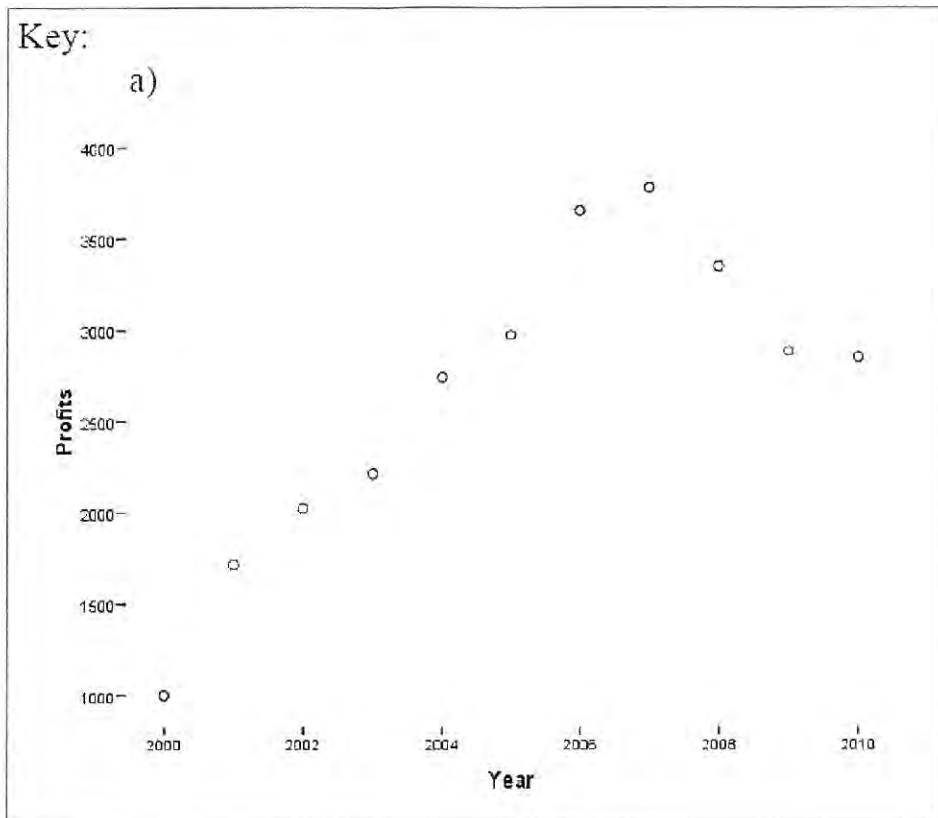| Year	Sales	Expen
2000	1456	
2001	2247	
2002	2639	
2003	2911	
2004	3478	
2005	3764	
2006	4609	
2007	4792	
2008	4521	
2009	3975	

Click on variable and drag to appropriate axis

Year
Sales
Expenses
Profits

X Axis

Y Axis

Create Graph   Start Over   Finish

a)

CCSS Match: S.ID.6a

Source: "Sample Innovative Items for Assessing Skills in Math and English Language Arts" from Sireci Psychometric Services (May 28, 2010)

Example #2

VII. Drawing Item Format

Drawing Item Format: Variation 1

A regular trapezoid is presented in the figure below.

Using the drawing tool found in the lower left hand corner of your screen, connect the two points that would connect the line of symmetry for this figure.

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CCSS Match: 4.G.3

Source: "Sample Innovative Items for Assessing Skills in Math and English Language Arts" from Sireci Psychometric Services (May 28, 2010)
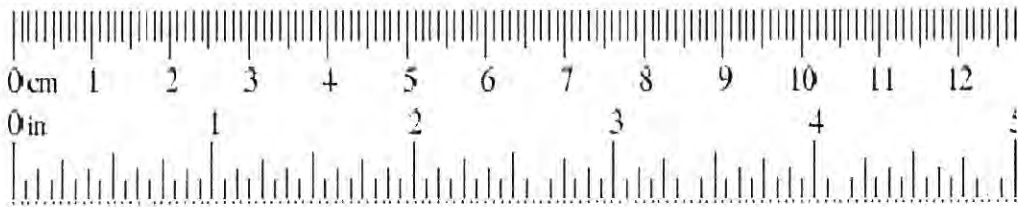
Example #3

Completion Item Example 2

Xiaoying cut a half-circle out of a piece of paper. The half-circle is shown below. She wants to know how long it is across the bottom.

Use the ruler below to measure the half-circle she cut out and enter your measurement in the space provided.

What is the measurement of the half circle along the bottom edge?
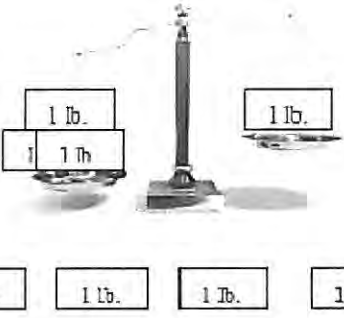

CCSS Match: 3.MD.4

Source: "Sample Innovative Items for Assessing Skills in Math and English Language Arts" from Sireci Psychometric Services (May 28, 2010)

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Example #4

IV. Drag-and-Drop Item Format

Drag-and-Drop Example 1:

How would you balance the scale pictured below? Drag the weights from below the scale onto the scale to make it balance.
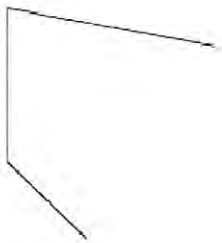
CCSS Match: 3.MD.2

Source: "Sample Innovative Items for Assessing Skills in Math and English Language Arts" from Sireci Psychometric Services (May 28, 2010)

Example #5

Click and drag on the three lines below to arrange them into a right triangle.

CCSS Match: 1.G.1

Source: "Sample Innovative Items for Assessing Skills in Math and English Language Arts" from Sireci Psychometric Services (May 28, 2010)