

**Practice Item Guide**

**Virginia Standards of Learning**

**Algebra II**

April, 2013  
Pearson

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## OVERVIEW

The practice items available in the Virginia SOL Algebra II practice tool provide examples of the new content and increased rigor represented by the 2009 SOL. Additionally, these items illustrate the new technology-enhanced item (TEI) types. These practice items do not cover all the Algebra II SOL and should not be used in place of review of the SOL test content.

This practice guide may be used by teachers or other adults to guide students through the practice items for Algebra II. While the use of this guide with the practice items is not required, it is strongly encouraged, as it will help ensure that students are familiar with the types of items that they may encounter while taking the Algebra II test. The directions in the guide will also lead students through practice with the online tools, and will familiarize students with how to navigate through the test, and how to use the Section Review screen within TestNav. Appendix B summarizes how student responses for TEI are indicated on the Section Review screen.

Prior to guiding students through the practice items, carefully read this practice item guide and review the practice items to become familiar with them. All directions that must be read aloud to the students are in **bold Arial font** so that they stand out from the rest of the text. All other text is for your information and should not be read to students. While these practice items will not be scored in TestNav, the correct answer for each question is provided as the item is reviewed in the guide, as well as in Appendix A.

The following Change Log indicates any updates to this document.

Change Log		
Version	Date	Description
V.1	03/05/2012	Original document posted.
V.2	10/31/2012	Additional practice items added to existing set. Various changes throughout guide regarding how TEI appear on the Section Review screen. Updated directions and screen shots for exiting TestNav. Added Appendix B.
V.3	11/05/2012	Answer to question #28 corrected on pages 43 and 58.
V.4	11/15/2012	Amended answer options on Question #21.
V.5	04/04/2013	Item #36 amended. New screenshot added.

## **SYSTEM REQUIREMENTS FOR TESTNAV**

The minimum hardware requirements for all workstations used to access TestNav are available at <http://www.pearsononlinetesting.com/TestNav/7/index.html>

## **TECHNOLOGY-ENHANCED ITEM (TEI) TYPES**

There are four types of technology-enhanced items:

- drag and drop,
- hot spot (which includes number line and coordinate plane items),
- bar graph or histogram, and
- fill-in-the-blank.

A brief description of each technology-enhanced item (TEI) type is provided below. The SOL practice items for Algebra II will introduce three of the TEI types.

### **Drag and Drop**

Drag and drop items contain draggers and bays.

- Draggers are the answer options that are moved to bays in response to the question.
- Bays are areas of an item where draggers will remain once moved there.

Drag and drop items require a student to respond by moving one or more draggers from one place on the screen into a bay(s) elsewhere on the screen.

The student will click on the dragger and keep the button down while moving the dragger to the desired location. Once the button is released, the dragger will be in the new location. Students can still move the dragger once it has been dropped into a bay.

### **Hot Spot**

Hot spot items contain hot spot zones which represent student answer options.

- Hot spot zones are answer options which may be part of a graphic, art, numbers, or text, that are selected in response to a question.
- Unlike a traditional multiple-choice item where only one answer option is correct, hot spot items may require the student to select one or more hot spot zones (answer options) in order to correctly answer the item.
- Number line and coordinate plane items require students to respond by clicking on a number line or coordinate plane to plot one or more points. In these items, the points themselves are the hot spot zones. Only points plotted with the pointer tool within TestNav, the testing software used in Virginia, are scorable responses. Points plotted with the dot tool are not scorable responses.

The student selects a hot spot by clicking on it. In some hot spot items, there will be an indication on the screen, such as the zone being outlined in light blue, which confirms that the pointer is over a hot spot. After the hot spot is clicked, there will always be an indication that the zone has been selected as an answer, such as the hot spot being outlined in burnt orange, the hot spot being shaded, an asterisk being placed on the hot spot, or a red point being plotted on the number line or coordinate plane.

### **Bar Graph or Histogram**

Bar graph or histogram items require students to graph data by indicating the height (if the bars are vertical) or length (if the bars are horizontal) of one or more bars or intervals. The bar height or length is graphed by clicking on a location within the graph or by dragging the bar to the desired location.

### **Fill-in-the-Blank**

Fill-in-the-Blank items require students to input characters from the keyboard (numbers, letters, or symbols) to answer the question. For this item type, the student responds to a question by typing into a blank box provided in the item.

- Some response boxes may limit the characters that can be entered. For instance, if the response is expected to be numeric, the student will not be able to enter letters.
- Students should carefully follow directions in fill-in-the-blank items, such as providing an answer in simplest form, rounding a number as indicated, or using significant digits.

## **OPENING THE VIRGINIA SOL MATHEMATICS PRACTICE ITEMS**

1. Go to the Virginia Department of Education website:  
[http://www.doe.virginia.gov/testing/sol/practice\\_items/index.shtml](http://www.doe.virginia.gov/testing/sol/practice_items/index.shtml)
2. Under the heading “Mathematics Practice Items” click on the Algebra II link. Since this is a web based application, the link will take you directly to the Algebra II Practice Items.

## MATERIALS NEEDED FOR COMPLETING VIRGINIA SOL MATH PRACTICE ITEMS

Scratch paper, pencil, and graphing calculator

## ONLINE TOOLS AVAILABLE ON THE VIRGINIA SOL MATH PRACTICE ITEMS

The following tools can be accessed by clicking the appropriate icon on the toolbar at the top of the screen. These tools can be used to assist the test taker in finding answers, and only the pointer tool can be used to respond to the questions.

Tool Icon	Description
	<b>Pointer</b> – Use the pointer to answer questions.
	<b>Eraser</b> – Use the eraser to remove lines or highlights.
	<b>Highlighter</b> – Use the highlighter tool to highlight text or graphics.
	<b>Eliminator</b> – Use the eliminator tool on multiple-choice questions to mark choices you do not wish to consider.
	<b>Pencil</b> – Use the pencil tool to make marks on the test questions.
	<b>Ruler</b> – Use the ruler tool to measure something on screen.
	<b>Straightedge</b> – Use the straightedge tool to draw straight lines and underline text.
	<b>Dot tool</b> – Use the dot tool to plot dots on the screen.
	<b>Exhibit</b> – Click the exhibit icon to view the formula sheet.
	<b>Help</b> – Use the help tool to display information about a specific tool on the top toolbar.

## SPECIFIC DIRECTIONS FOR THE SOL ALGEBRA II PRACTICE ITEMS

### Introduction

After the practice items are launched, the first sample item will be displayed. Read the following instructions to the students.

**SAY** Today you will be working on some Algebra II practice items for the SOL test. There are 37 questions that will show you some of the types of test items that will be administered as part of the end-of-course Algebra II assessment. Some questions are multiple-choice and others are technology-enhanced items. Technology-enhanced items require you to show your answer in another way, such as typing the answer in a box, completing a graph, or clicking and dragging the answer to a specific location.

Listen carefully as I read the directions for these practice items. I will guide you through each item one at a time. Please remember that the questions you see are practice questions. They will not be scored, but I will tell you the correct answer for each item.

Are there any questions before we start?

Pause to answer questions.

**SAY** *Next* and *Previous* buttons appear at the bottom of the screen for each question. Clicking *Next* takes you to the next question. Clicking *Previous* takes you back to the previous question. Notice that the question numbers are also located at the bottom of the screen. For example, the screen with Sample A reads “Sample.”



**SAY** At any time, you may click on the *Flag for Review* button (  ) located at the bottom left of the screen. This should be used for any question that you want to review at a later time. We will practice using this button when we are working on the practice items.

Now let's look at the top of your screen.

Pause. The picture below is the toolbar students will see at the top of the screen.

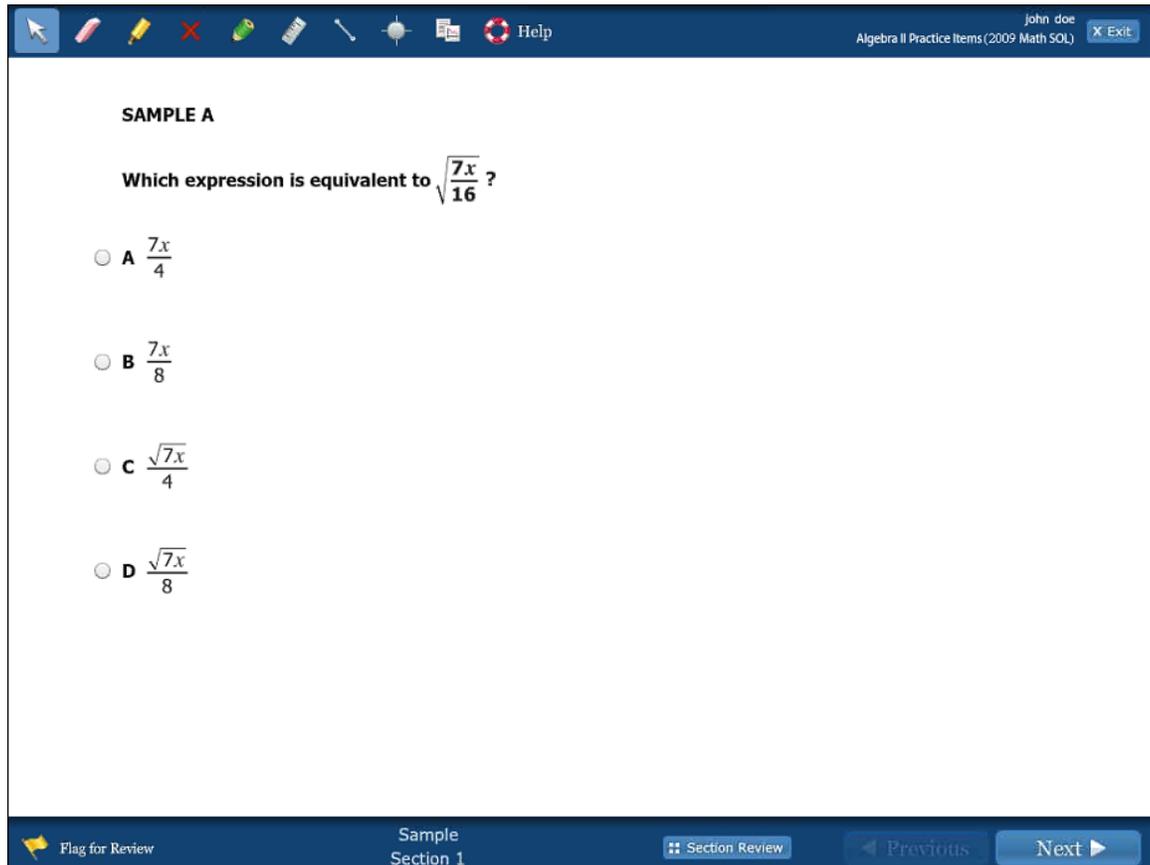


**SAY** The tools you may use are in the toolbar at the top of the screen. We will practice with some of the tools as we work through the practice questions. If you forget what a tool does, you can click on the Help symbol (  ) to read about the tool.

The Help tool has information about the tools. If you would like your students to explore the Help tool, you can have them do this at the end of the practice items, after they have been exposed to the tools while working these items.

**SAY** One thing to remember is that the tools at the top of the screen are there to help you solve a problem. The only tool that can be used to mark an answer to a question is the pointer tool (  ).

Let's look at the first item, Sample A.



The screenshot shows a digital math practice interface. At the top, there is a toolbar with various tools: a pointer (highlighted), eraser, highlighter, red X, green checkmark, calculator, ruler, protractor, and a Help icon. The user's name 'John doe' and the title 'Algebra II Practice Items (2009 Math SOL)' are visible in the top right. The main content area displays 'SAMPLE A' and the question: 'Which expression is equivalent to  $\sqrt{\frac{7x}{16}}$ ?' Below the question are four radio button options: A  $\frac{7x}{4}$ , B  $\frac{7x}{8}$ , C  $\frac{\sqrt{7x}}{4}$ , and D  $\frac{\sqrt{7x}}{8}$ . At the bottom, there is a navigation bar with a 'Flag for Review' button, 'Sample Section 1', a 'Section Review' button, and 'Previous' and 'Next' buttons.

**SAY** Read the question to yourself and select the correct answer by clicking the circle next to it.

Pause while students read and answer the question.

**SAY** Which answer did you choose?

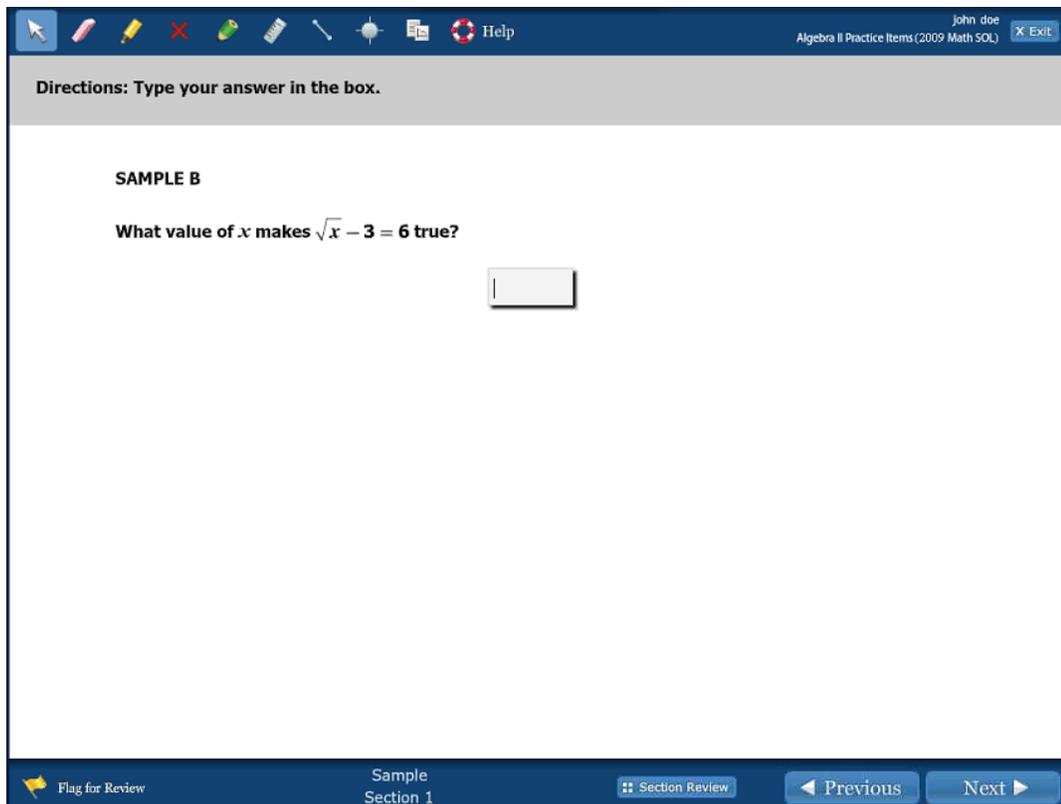
Pause for replies.

**SAY** You should have selected C,  $\frac{\sqrt{7x}}{4}$ .

Click *Next* at the bottom of the screen to go to the next sample item.

Pause while students go to the next sample item.

- SAY** Sample B has a gray directions banner under the toolbar that tells you how to answer the question. When a question has a directions banner, you should always read it before solving the problem. The directions banner says, “Type your answer in the box.”



The screenshot shows a software interface for a math practice item. At the top, there is a toolbar with various icons (pointer, eraser, highlighter, delete, calculator, ruler, compass, protractor, help) and a user name 'John doe' and 'Algebra II Practice Items (2009 Math SOL)' with an 'Exit' button. Below the toolbar is a gray banner with the text 'Directions: Type your answer in the box.' The main area contains the text 'SAMPLE B' and the question 'What value of  $x$  makes  $\sqrt{x} - 3 = 6$  true?'. Below the question is a small, empty rectangular input box. At the bottom, there is a navigation bar with a 'Flag for Review' button, 'Sample Section 1', a 'Section Review' button, and 'Previous' and 'Next' buttons.

- SAY** This sample question is an example of a fill-in-the-blank technology-enhanced item.

You may use scratch paper and your calculator to solve for the answer. Then type your answer in the box on the screen using the keyboard. Make sure you are using the pointer tool, and then click inside the box before you type your answer.

Pause while students find and enter the answer.

- SAY** Which answer did you type in the box?

Pause for replies.

- SAY** The correct answer is 81.

When we are done looking at the practice items, we will look at a Section Review screen. The Section Review screen shows which questions you have answered and which questions you have not answered. For questions that are fill-in-the-blank, once any character is entered into the response box, the question will show as “Answered” on the Section Review screen.

Do you have any questions about how to enter your answer?

Answer all questions.

**SAY Notice the correct answer does not need to be the same length as the box.**

**Try entering other characters into the box such as letters, spaces, or other symbols.**

Pause while students try to enter other characters. In this item, they will not be able to enter any characters other than numbers.

**SAY This box will only accept numbers. If a letter, number, or symbol does not appear in the answer box after you've tried it, then you cannot use that character in your answer.**

**You can use the backspace key on the keyboard to clear your answer or the delete key. To use the delete key, click in front of the numbers you want to clear; press "delete" to remove each number one at a time. Try clearing your answer and retyping it in the box.**

Pause while students practice clearing their answer.

**SAY Do you have any questions?**

Answer all questions.

**SAY Click *Next* at the bottom of the screen to go to the first practice item.**

Pause while students go to the first practice item.

**SAY Notice the bottom of your screen now says "Question 1 of 37."**

John doe  
Algebra II Practice Items (2009 Math SOL) X Exit

What is the solution set for this equation?

$$3\sqrt{2x-4} + 6 = 3$$

A  $\left\{\frac{5}{2}\right\}$

B  $\left\{\frac{1}{2}\right\}$

C  $\left\{-\frac{1}{2}\right\}$

D  $\{ \}$

Flag for Review Question 1 of 37 Section 1 Section Review Previous Next

**SAY** Before you read the question, let's practice using the eliminator tool. On a multiple-choice question, the eliminator tool will help you mark choices that you do not wish to consider. At the top of the toolbar, click on the button with the red . Selecting this tool will change your pointer to an arrow with a red X next to it. You can use this tool to eliminate as many choices as you want. To eliminate an answer, you would click the choices you believe are not correct. Practice putting a red X over choices A and B. Then click on the eliminator tool again to put the tool away.

Wait for students to eliminate choices and put the tool away. The eliminator tool can only be used on multiple-choice questions and not on technology-enhanced items.

**SAY** If you eliminate a choice and then change your mind, use the eraser tool () on the toolbar to erase a red X. Click on the eraser tool and practice using it to remove the red X on answer choices A and B.

Pause while students practice using this tool.

**SAY** Click on the eraser tool icon to put it away. Now read the first question, use the eliminator to narrow down your choices, and then click on your answer.

Pause while students work to eliminate choices and find the answer to the question.

**SAY** Which answer did you choose?

Pause for replies.

**SAY** The correct answer is option D, { }, the empty set. Do you have any questions about the answer or about using the eliminator tool?

Answer all questions.

**SAY** Click *Next* at the bottom of the screen to go to question 2.

Pause.

**SAY** Read the question to yourself and select the correct answer.

Pause while students solve the problem and select an answer.

The screenshot shows a digital math practice interface. At the top, there is a toolbar with icons for a mouse, eraser, highlighter, calculator, and help. The user's name 'John doe' and the title 'Algebra II Practice Items (2009 Math SOL)' are visible in the top right corner. The main content area contains the question: 'What are the y-coordinates for the solutions to this system of equations?' followed by the system of equations: 
$$\begin{cases} x^2 + 6x + 3y + 6 = 0 \\ x + y + 20 = 0 \end{cases}$$
 Below the equations are four multiple-choice options, each with a radio button:   
A  $y = -9$  and  $y = 6$    
B  $y = -20$  and  $y = -2$    
C  $y = -26$  and  $y = -11$    
D  $y = -27$  and  $y = -18$    
At the bottom of the interface, there is a navigation bar with a 'Flag for Review' button, 'Question 2 of 37 Section 1', a 'Section Review' button, and 'Previous' and 'Next' buttons.

**SAY** What answer did you choose?

Pause for replies.

**SAY** You should have chosen C,  $y = -26$  and  $y = -11$ .

**Are there any questions?**

Answer all questions.

**SAY** Before we go to the next question, let's take a moment to practice using the highlighter tool. You can use the highlighter tool on the toolbar to highlight words. To use this tool, click the icon that looks like a picture of a yellow highlighter



( ). Clicking the highlighter tool will change your pointer tool to an arrow with a highlighter next to it.

Practice using the highlighter by highlighting the question, "What are the y-coordinates for the solutions to this system of equations?" Then click again on the highlighter tool on the toolbar to put the tool away.

Pause while students highlight the text and put the tool away. Assist students as necessary.

**SAY** Do you have any questions about how to highlight text?

Answer all questions.

**SAY** Click *Next* at the bottom of the screen to go to question 3. Read question 3 to yourself and then determine the answer.

Pause while students read the question and determine the answer.

The screenshot shows a math practice interface. At the top, there is a toolbar with various icons including a pointer, highlighter, eraser, and help. The main area contains the question: "Which function is best represented by this graph?" Below the question is a coordinate plane with a grid. The x-axis ranges from -10 to 10, and the y-axis ranges from -10 to 10. A hyperbola is graphed with two branches. One branch is in the upper-right region, passing through the point (4, 2) and approaching the x-axis and y-axis as asymptotes. The other branch is in the lower-left region, passing through the point (-4, -2) and also approaching the x-axis and y-axis as asymptotes. Below the graph are four multiple-choice options:

- A  $f(x) = \frac{8}{x+3}$
- B  $f(x) = \frac{8}{x-3}$
- C  $f(x) = \frac{x+1}{x+3}$
- D  $f(x) = \frac{x+1}{x-3}$

At the bottom of the interface, there is a navigation bar with buttons for "Flag for Review", "Section Review", "Previous", and "Next". The text "Question 3 of 37" and "Section 1" is also visible.

**SAY** Which answer did you choose?

Pause for replies.

**SAY** The correct answer is option B,  $f(x) = \frac{8}{x-3}$ .

**SAY** Are there any questions?

Answer all questions.

**SAY** Click *Next* at the bottom of the screen to go to question 4.

Pause.

The screenshot shows a digital math practice interface. At the top, there is a toolbar with icons for a mouse, eraser, highlighter, red X, green highlighter, calculator, pencil, and a Help button. The user's name 'John doe' and the title 'Algebra II Practice Items (2009 Math SOL)' are visible in the top right corner. The main content area displays the question: 'The graph of  $g(x) = \frac{x+1}{x}$  has —'. Below the question are four multiple-choice options, each with a radio button: A two  $x$ -intercepts and no  $y$ -intercept; B two  $x$ -intercepts and one  $y$ -intercept; C one  $x$ -intercept and no  $y$ -intercept; D one  $x$ -intercept and one  $y$ -intercept. At the bottom of the interface, there is a navigation bar with a 'Flag for Review' button, 'Question 4 of 37 Section 1', a 'Section Review' button, and 'Previous' and 'Next' buttons.

**SAY** Read question 4 to yourself. Then take a moment to answer the question.

Pause while students answer the question.

**SAY** Which answer did you choose?

Pause for replies.

**SAY** You should have selected C, one  $x$ -intercept and no  $y$ -intercept.

**Do you have any questions?**

Answer all questions.

**SAY** Click *Next* at the bottom of the screen to continue to the next question.

Pause.

The screenshot shows a digital math practice interface. At the top, there is a toolbar with various icons for navigation and editing, including a mouse cursor, eraser, highlighter, and a straightedge tool. The user's name "John doe" and the page title "Algebra II Practice Items (2009 Math SOL)" are visible in the top right corner. The main content area contains the following text:

Which of the following describes the end behavior of  $h(x) = \frac{x-6}{x^2}$  as  $x$  approaches negative infinity?

Four multiple-choice options are listed:

- A  $y$  approaches negative infinity
- B  $y$  approaches  $-6$
- C  $y$  approaches  $-1$
- D  $y$  approaches  $0$

At the bottom of the interface, there is a navigation bar with a "Flag for Review" button, the text "Question 5 of 37 Section 1", a "Section Review" button, and "Previous" and "Next" navigation buttons.

**SAY** Read question 5 to yourself. Then take a moment to answer the question.

Pause while students answer the question.

**SAY** Which answer did you choose?

Pause for replies.

**SAY** You should have selected D,  $y$  approaches 0.

Do you have any questions about the answer?

Answer all questions.

**SAY** Before we go to the next question, let's practice using the straightedge tool. You can use the straightedge tool on the toolbar to make a straight line or to underline

text. Look for the straightedge tool icon (  ) at the top of the screen. The icon is a line with points on either end. When you click on the straightedge tool, you will see a drop down box. Select Tool 2. Your pointer will now have an arrow with a slanted line next to it.

Practice using the straightedge by underlining the key phrases “end behavior” and “negative infinity” in the question. Then click again on the straightedge tool on the toolbar to put the tool away.

Pause while students underline the text and put the tool away. Assist students as necessary.

**SAY** Click *Next* at the bottom of the screen to continue to the next question.

Pause.

**SAY** Read question 6 to yourself and answer the question.

Pause while students read and answer the question.

The amount of lost revenue from tickets not sold for a concert is shown in the table. The ticket prices include tax.

**Lost Revenue From Tickets Not Sold**

Price per Ticket ( $x$ )	\$25	\$35	\$55	\$125
Number of Tickets Not Sold	84	80	92	323
Amount of Lost Revenue ( $y$ )	\$2,100	\$2,800	\$5,060	\$40,325

Which equation best models the relationship between  $y$ , the amount of lost revenue, and  $x$ , the price per ticket?

A  $y = 1,218(1.01)^x$

B  $y = 997(1.03)^x$

C  $y = 400x - 11,570$

D  $y = 156x - 10,000$

Flag for Review      Question 6 of 37      Section 1      Section Review      Previous      Next

**SAY** Which answer did you choose?

Pause for replies.

**SAY** You should have selected B,  $y = 997(1.03)^x$ .

Do you have any questions?

Answer all questions.

**SAY** Click *Next* at the bottom of the screen to go to question 7.

Pause.

**SAY** Read the question to yourself.

The screenshot shows a web-based math practice interface. At the top, there is a toolbar with various icons for editing and navigation, including a mouse cursor, eraser, highlighter, and a 'Help' button. The user's name 'John doe' and the page title 'Algebra II Practice Items (2009 Math SOL)' are visible in the top right corner. The main content area contains a question: 'A normally distributed set of 968 values has a mean of 108 and a standard deviation of 11. Which is closest to the number of values expected to be above 125?'. Below the question are four radio button options: A 910, B 789, C 210, and D 59. At the bottom of the interface, there is a navigation bar with a 'Flag for Review' button, 'Question 7 of 37 Section 1', a 'Section Review' button, and 'Previous' and 'Next' navigation buttons.

**SAY** For items where you may need a formula to solve the problem, or a z-table, you should refer to the exhibit tool located in the toolbar to find the formula sheet or z-table.

Let's take a moment to locate the formula sheet. Click on the exhibit tool () , the icon that looks like two pieces of paper. You will see tabs inside the exhibit window for the formula sheet and for the z-table. Click on the tab for the formula sheet and it will appear inside a window. You can resize the window by dragging the right corner of the window. You can use the scroll bar on the right side of the formula sheet window to view all of the formulas. After you write the formula you need on your scratch paper, click on the exhibit tool to put the formula sheet away.

Now solve the problem and choose your answer.

Pause while students work to find the answer.

**SAY** Which answer did you choose?

Pause for replies.

**SAY** The correct answer is option D, 59.

Do you have any questions?

Answer all questions.

**SAY** Click *Next* at the bottom of the screen to go to question 8.

Pause.

**SAY** Question 8 is an example of a drag and drop technology-enhanced item. The directions banner says, “Click and drag each selected property to the correct box.” You will click and drag the properties from the dark gray box to the correct location in the “Justification” column. To completely answer the question, you must place a property into each box.

You may answer the question now. If you change your mind after clicking and dragging a property to a box, you can drag the property back to the dark gray box and then select another property to drag into the empty box.

Pause while students read and answer the question.

Directions: Click and drag each selected property to the correct box.

The steps used to simplify an expression are shown. Identify the missing property that justifies each step.

Steps	Justification
$5i + 4(6 + 3i)$	Given Expression
$5i + 24 + 12i$	
$24 + 5i + 12i$	
$24 + (5i + 12i)$	
$24 + 17i$	Substitution Property

Associative Property of Addition	Distributive Property
Closure Property of Addition	Identity Property of Addition
Commutative Property of Addition	Inverse Property of Addition

Flag for Review      Question 8 of 37 Section 1      Section Review      Previous      Next

**SAY** Which properties did you select?

Pause for replies.

**SAY** From top to bottom, you should have selected: Distributive Property, Commutative Property of Addition, and Associative Property of Addition. You must have placed each of these three properties in the correct position for the item to be correct.

**SAY** It is important to note that in order for this item to be completely answered, each justification box must contain a property. If you only placed one or two properties inside the boxes, this item would show as “Unanswered” on the Section Review screen in TestNav.

**Do you have any questions?**

Please note that additional information regarding the requirements for an item to appear as “Answered” on the Section Review screen within TestNav is located in Appendix B for reference.

**SAY** Before we go on to the next question, click on the *Flag for Review* button on the bottom left of the screen. If this were an actual SOL test, you would click this button if you wanted to come back and review the question again.

Pause while students click on this icon.

**SAY** When we reach the end of the practice questions, I will show you how the questions you flag for review will look on the Section Review screen. The Section Review screen shows which questions you have answered and which questions you have not answered. The questions you *Flag for Review* will have a picture of a flag next to them.

Pause.

**SAY** Click *Next* at the bottom of the screen to go to question 9.

Pause.

**SAY** Question 9 is a fill-in-the-blank technology-enhanced item. The gray directions banner at the top of the screen says, “Type your answer in the box. Your answer must be in the form of an integer.” In order to be scored correctly, it is very important to answer the question exactly as the directions are written. In this item, you must enter an integer as your answer.

**Now read and answer the question.**

Pause while students work to answer the question.

John doe  
Algebra II Practice Items (2009 Math SOL) X Exit

Directions: Type your answer in the box. Your answer must be in the form of an integer.

The following sequence is given in recursive form.

$$\begin{cases} a_1 = 8 \\ a_n = 2a_{n-1} + 5, \text{ for } n \geq 2 \end{cases}$$

What is the value of the third term of this sequence?

$a_3 =$

Flag for Review Question 9 of 37 Section 1 Section Review Previous Next

**SAY** How did you answer the question?

Pause for replies.

**SAY** You should have entered 47. Again, the correct answer does not need to be the same length as the box.

For fill-in-the-blank questions such as this, once any character is entered into the response box, the question will show as “Answered” on the Section Review screen. Do you have any questions?

Answer all questions.

Please note that additional information regarding the requirements for an item to appear as “Answered” on the Section Review screen within TestNav is located in Appendix B for reference.

**SAY** Click *Next* at the bottom of the screen to continue to the next question.

Pause.

**SAY** Question 10 is an example of a technology-enhanced item for which there may be more than one correct response. The directions say, “Click on a box to choose each function you want to select. You must select all correct functions.”

**SAY** To answer the item correctly, you need to select all the correct answers by clicking on them. If you change your mind about an answer, you can click the answer choice and it will remove your selection, or you can use the eraser tool at the top of the screen to remove your selection.

Before you answer this question, let's practice using the pencil tool to eliminate the answer choices you do not wish to consider. Click the icon on the toolbar that

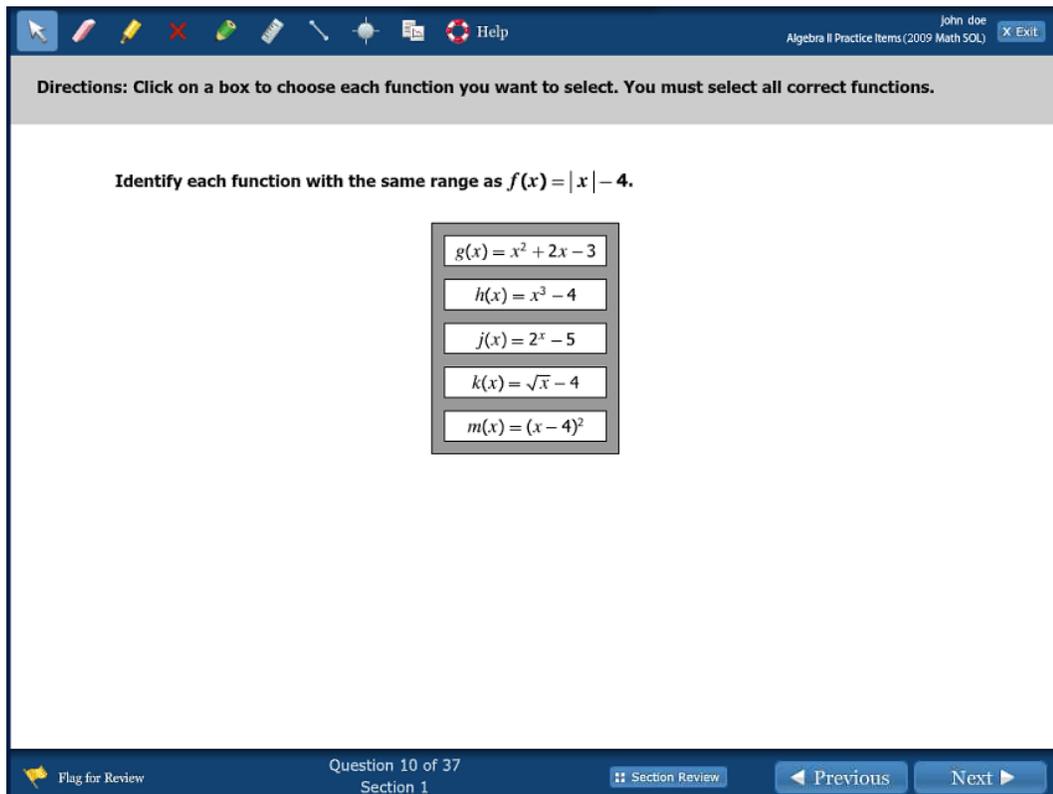
looks like a green pencil (). Draw an "x" over the last answer choice in the list. Then put the pencil tool away by clicking on the icon again. Since this is a technology-enhanced item, you cannot use the eliminator tool to eliminate your answer choices. (Pause.)

If you change your mind after eliminating an answer with the pencil tool, you can use the eraser tool to remove the "x". Practice removing the x you have drawn. (Pause.)

When you are done with the eraser tool, click on the eraser icon again to put the tool away.

Now read the question and determine the correct answer or answers. You may use the pencil tool to eliminate answer choices, if that will help you answer the item.

Pause while students answer the question.



Directions: Click on a box to choose each function you want to select. You must select all correct functions.

Identify each function with the same range as  $f(x) = |x| - 4$ .

$g(x) = x^2 + 2x - 3$

$h(x) = x^3 - 4$

$j(x) = 2^x - 5$

$k(x) = \sqrt{x} - 4$

$m(x) = (x - 4)^2$

Flag for Review      Question 10 of 37      Section 1      Section Review      Previous      Next

**SAY** How did you answer the question?

Pause for replies.

**SAY You should have selected:**

$$g(x) = x^2 + 2x - 3 \text{ and}$$

$$k(x) = \sqrt{x} - 4$$

**You must have both of these functions selected, and only these functions selected, for your answer to be correct.**

**Since the number of correct answers was not indicated in the item, this item will show as “Answered” on the Section Review screen once one number is selected. This is so no hint or clue is given as to how many numbers are correct.**

**Do you have any questions?**

Answer all questions.

Please note that additional information regarding the requirements for an item to appear as “Answered” on the Section Review screen within TestNav is located in Appendix B for reference.

**SAY On the actual SOL test, you may see questions that require you to pick one or more answers. Some questions will tell you the number of correct answers to select. Other questions, like this one, will not give you the number of answers to select. You will have to decide how many correct answers there are.**

Please make sure students understand this concept, as a traditional multiple-choice question only requires one answer.

**SAY Click *Next* at the bottom of the screen to continue to the next question.**

Pause.

**SAY Read the directions banner and question 11 to yourself, then select an answer or answers. Remember, you can use the pencil tool to eliminate choices on this type of technology-enhanced item.**

Pause while students read and answer the question.

Directions: Click on a box to choose each interval you want to select. You must select all correct intervals.

Indicate the intervals where the graph of  $f(x) = 2x^3 - 3x^2 - 12x + 20$  is only increasing throughout the interval.

$-\infty < x < \infty$   
  $-\infty < x < -1$   
  $-2.5 < x < \infty$   
  $-1 < x < 2$   
  $0 < x < \infty$   
  $2 < x < \infty$

Question 11 of 37  
Section 1

Section Review Previous Next

**SAY** Which intervals did you choose?

Pause for replies.

**SAY** You should have chosen  $-\infty < x < -1$  and  $2 < x < \infty$ . You must have both of these intervals selected, and only these intervals, for your answer to be correct.

Since the number of correct answers was not indicated in the item, this item will show as “Answered” on the Section Review screen once one number is selected. This will be true for all items that direct you to “select all.” Again, this is so no hint or clue is given as to how many answers are correct.

**Are there any questions?**

Answer all questions.

Please note that additional information regarding the requirements for an item to appear as “Answered” on the Section Review screen within TestNav is located in Appendix B for reference.

**SAY** Question 12 is an example of a drag and drop technology-enhanced item. The directions banner says, “Click and drag each selected equation to the correct box.” To answer the question, you will click on an equation in the dark gray box and drag it to the empty boxes labeled “Horizontal Asymptote” or “Vertical Asymptote.”

Now, read the question and select the asymptotes.

John doe  
Algebra II Practice Items (2009 Math SOL) Exit

Directions: Click and drag each selected equation to the correct box.

Identify the equation of the horizontal asymptote and the equation of the vertical asymptote of  $g(x) = \frac{4x+1}{x-3}$ .

Horizontal Asymptote	Vertical Asymptote

$x = 0$	$x = \frac{1}{4}$	$x = 3$
$y = -\frac{1}{3}$	$y = 0$	$y = 4$

Flag for Review      Question 12 of 37      Section 1      Section Review      Previous      Next

Pause while students create the system.

**SAY** Which equations did you choose?

Pause for replies.

**SAY** In the box labeled “Horizontal Asymptote,” you should have placed the equation  $y = 4$ . In the box labeled “Vertical Asymptote,” you should have placed the equation  $x = 3$ . You must have placed both of these equations correctly for the item to be correct.

In order for this item to show as “Answered” on the Section Review screen, an answer option must be placed in each of the empty boxes. If you had dragged an equation into only one of the boxes, this item would show as “Unanswered” on the Section Review screen.

**Do you have any questions?**

Answer all questions.

Please note that additional information regarding the requirements for an item to appear as “Answered” on the Section Review screen within TestNav is located in Appendix B for reference.

**SAY** Click *Next* at the bottom of the screen to go to question 13.

Pause.

**SAY** Read the directions banner and the question to yourself, then answer the question. Be sure to follow the directions you are given when entering your answer.

The screenshot shows a web-based math practice interface. At the top, there is a toolbar with various icons for navigation and editing, and a user profile section for 'John doe' with an 'Exit' button. Below the toolbar is a grey banner with the text: 'Directions: Type your answer in the box. Enter your answer as a whole number.' The main content area contains the question: 'A store owner employs a total of 3 cashiers and 7 clerks. The owner plans to select a committee of 1 cashier and 2 clerks. What is the number of different committees the owner could choose?' Below the question is a small, empty rectangular input box. At the bottom of the interface, there is a navigation bar with a 'Flag for Review' button, the text 'Question 13 of 37 Section 1', a 'Section Review' button, and 'Previous' and 'Next' navigation buttons.

Pause while students solve the problem and enter a response.

**SAY** How did you answer the question?

Pause for replies.

**SAY** You should have entered 63.

**Are there any questions?**

Answer all questions.

**SAY** Click *Next* at the bottom of the screen.

Pause.

**SAY** Read the question to yourself and answer it. You may use any of the tools we have practiced, as well as your scratch paper and calculator, as you find an answer to the question.

Pause while students solve the problem and select an answer.

Throughout which interval is  $f(x) = 2x^3 - 3x^2 - 12x$  increasing?

A  $-2 < x < 0$

B  $-\infty < x < -1$

C  $-1 < x < 2$

D  $-20 < x < \infty$

**SAY** Which answer did you choose?

Pause for replies.

**SAY** The correct answer is B,  $-\infty < x < -1$ . Do you have any questions?

Answer all questions.

**SAY** Click *Next* at the bottom of the screen to continue to the next question.

Pause.

**SAY** Read the directions banner and question 15 to yourself.

Pause while students read the directions and the question.

**SAY** If you change your mind after selecting a region under the curve, click on that bar again and it will remove your selection. You may answer the question.

Pause while students find the solution and select responses.

John doe  
Algebra II Practice Items (2009 Math SOL) X Exit

Directions: Click on each region you want to select. You may select more than one region.

This graph summarizes the test scores of 50,000 students. The data is normally distributed with a mean of 81 and a standard deviation of 2.5.

**Student Scores**

Identify the regions under the curve where only the data for approximately 23,750 students are located.

Flag for Review Question 15 of 37 Section 1 Section Review Previous Next

**SAY** Which regions under the curve did you select as your answer?

Pause for replies.

**SAY** For question 15, there is more than one correct combination. The correct combinations are:

the regions between 76.0 and 78.5 and between 78.5 and 81.0, or  
the regions between 76.0 and 78.5 and between 81.0 and 83.5, or  
the regions between 78.5 and 81.0 and between 83.5 and 86.0, or  
the regions between 81.0 and 83.5 and between 83.5 and 86.0.

Since the number of correct regions was not indicated in the item, this item will show as “Answered” on the Section Review screen once one region is selected.

**Do you have any questions?**

Answer all questions.

Please note that additional information regarding the requirements for an item to appear as “Answered” on the Section Review screen within TestNav is located in Appendix B for reference.

**SAY** Click *Next* at the bottom of the screen to go to question 16.

Pause.

**SAY** Question 16 is a fill-in-the-blank technology-enhanced item. The directions say, “Type your answer in the box. Use ‘/’ for the fraction bar or ‘.’ for the decimal point.”

**SAY** Now read the question and solve the problem.

Pause while students read and solve the item.

The screenshot shows a digital math practice interface. At the top, there is a toolbar with various icons for editing and navigation, and a user profile for 'John doe' with an 'Exit' button. Below the toolbar, a grey bar contains the directions: 'Directions: Type your answer in the box. Use "/" for the fraction bar or "." for the decimal point.' The main area of the screen displays the question: 'What is the zero of  $g(x) = 9^x - 243$ ?' followed by 'x =' and a text input box. At the bottom, a dark blue navigation bar includes a 'Flag for Review' button, the text 'Question 16 of 37 Section 1', a 'Section Review' button, and 'Previous' and 'Next' buttons.

**SAY** How did you answer the question?

Pause for replies.

**SAY** The correct answer is  $\frac{5}{2}$  or 2.5. If you entered your answer in fraction form, you should have entered *five forward slash two (5/2)*. Do you have any questions?

Answer all questions. All mathematically equivalent answers to 2.5 in fraction or decimal form are acceptable as answers for this particular item.

**SAY** Remember, once a character is entered into the response box, the question will show as “Answered” on the Section Review screen.

Click *Next* at the bottom of the screen to go to the next question.

Pause.

**SAY** Read the directions and question 17 to yourself.

Pause while students read the question.

John doe  
Algebra II Practice Items (2009 Math SOL) X Exit

Directions: Click on a box to choose each function you want to select. You must select all correct functions.

The graph of the parent function is shown.

Identify each function which belongs to this same family.

$f(x) = \frac{-3}{x^2}$	$f(x) = \frac{3}{x}$	$f(x) = \frac{3}{(x+1)^2}$	$f(x) = \frac{-3}{x+1}$
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Flag for Review Question 17 of 37 Section 1 Section Review Previous Next

**SAY** Be sure to follow the directions given in the banner as you answer the question. Now find a solution and select the answer or answers.

Pause while students answer the question.

**SAY** Which functions did you choose?

Pause for replies.

**SAY** You should have chosen  $f(x) = \frac{-3}{x^2}$  and  $f(x) = \frac{3}{(x+1)^2}$ . You must have selected both of these functions, and only these functions, for your answer to be correct.

Since you are directed to “select all” and the number of correct answers was not indicated in the item, this item will show as “Answered” on the Section Review screen once one function is selected.

**Do you have any questions?**

Answer all questions.

Please note that additional information regarding the requirements for an item to appear as “Answered” on the Section Review screen within TestNav is located in Appendix B for reference.

**SAY** Click *Next* at the bottom of the screen to go to the next question.

Pause.

**SAY** Read the directions and question 18 to yourself then answer it.

Pause while students read and answer the question.

The screenshot shows a digital test interface. At the top, there is a toolbar with icons for navigation and a 'Help' button. The user's name 'John doe' and the test title 'Algebra II Practice Items (2009 Math SOL)' are visible in the top right. The main content area contains the following text: 'Directions: Click on a box to choose each x-coordinate. You must select all of the correct x-coordinates.' Below this, the question asks to 'Identify the x-coordinate of each point that is in the solution set of the system of equations.' The system of equations is displayed as 
$$\begin{cases} 5x - 4y - 11 = 0 \\ y = x^2 - x - 6 \end{cases}$$
 Below the equations is a grid of ten boxes containing the following x-coordinates: -0.25, -1, -2, -3.25, -13 in the first row; and 0.25, 1, 2, 3.25, 13 in the second row. At the bottom of the interface, there is a navigation bar with a 'Flag for Review' button, the text 'Question 18 of 37 Section 1', a 'Section Review' button, and 'Previous' and 'Next' buttons.

**SAY** Which values did you choose for the  $x$ -coordinate?

Pause for replies.

**SAY** You should have selected  $-1$  and  $3.25$ . You must have both of these values selected, and only these values, for your response to be correct.

Since this item directs you to “select all,” the question will show as “Answered” on the Section Review screen once one of the numbers is selected.

**Do you have any questions?**

Answer all questions.

Please note that additional information regarding the requirements for an item to appear as “Answered” on the Section Review screen within TestNav is located in Appendix B for reference.

**SAY** Click *Next* at the bottom of the screen to go to question 19.

Pause.

**SAY** Read the directions and question 19 to yourself then answer it.

Pause while students read and answer the question.

The screenshot shows a digital math practice interface. At the top, there is a dark blue toolbar with various icons for navigation and assistance, including a mouse cursor, eraser, highlighter, red X, green checkmark, calculator, and a 'Help' button. The user's name 'John doe' and the page title 'Algebra II Practice Items (2009 Math SOL)' are visible in the top right corner. The main content area is white and contains the following text:

Which is the factored form of  $125m^3 - 343$  ?

- A  $(5m - 7)^3$
- B  $(5m - 7)(25m^2 + 35m + 49)$
- C  $(5m - 7)(25m^2 + 70m + 49)$
- D  $(5m - 7)(25m^2 - 35m - 49)$

At the bottom of the interface, there is a dark blue footer bar. On the left, there is a 'Flag for Review' button. In the center, it says 'Question 19 of 37' and 'Section 1'. On the right, there are 'Section Review', 'Previous', and 'Next' buttons.

**SAY** Which answer did you choose?

Pause for replies.

**SAY** You should have chosen B,  $(5m - 7)(25m^2 + 35m + 49)$ . Do you have any questions?

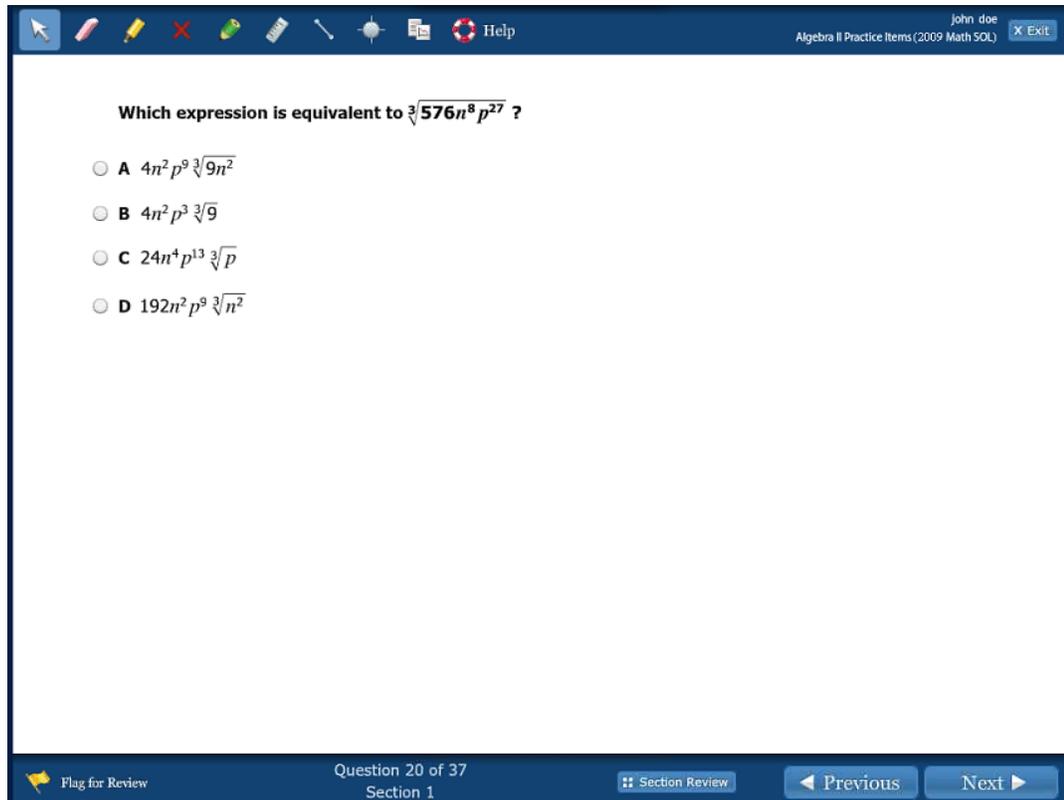
Answer all questions.

**SAY** Click *Next* at the bottom of the screen to go to question 20.

Pause.

**SAY** Read the directions and question 20 to yourself then answer it.

Pause while students read and answer the question.



The screenshot shows a digital math practice interface. At the top, there is a toolbar with icons for a mouse, eraser, highlighter, delete, calculator, and help. The user's name "John doe" and the title "Algebra II Practice Items (2009 Math SOL)" are visible in the top right corner. The main content area contains the question: "Which expression is equivalent to  $\sqrt[3]{576n^8p^{27}}$  ?". Below the question are four multiple-choice options: A  $4n^2p^9\sqrt[3]{9n^2}$ , B  $4n^2p^3\sqrt[3]{9}$ , C  $24n^4p^{13}\sqrt[3]{p}$ , and D  $192n^2p^9\sqrt[3]{n^2}$ . At the bottom of the interface, there is a navigation bar with a "Flag for Review" button, "Question 20 of 37" and "Section 1" indicators, a "Section Review" button, and "Previous" and "Next" navigation buttons.

**SAY** Which answer did you choose?

Pause for replies.

**SAY** You should have chosen A,  $4n^2p^9\sqrt[3]{9n^2}$ . Do you have any questions?

Answer all questions.

**SAY** Click **Next** at the bottom of the screen to go to question 21.

Pause.

**SAY** Read the directions and question 21 to yourself then answer it.

Pause while students read and answer the question.

The table shows the height in feet,  $y$ , of a baseball above the ground  $x$  seconds after the baseball was hit.

**Height of a Baseball**

<b>Time in Seconds (<math>x</math>)</b>	1	2	3	4	5
<b>Height in Feet (<math>y</math>)</b>	93	149	174	168	127

Which equation best models the data?

A  $y = -16.07(x - 3)^2 + 174$   
 B  $y = 8.5x + 84.5$   
 C  $y = -16.07x^2 + 105.13x + 3.6$   
 D  $y = 8.7x + 116.1$

John doe  
Algebra II Practice Items (2009 Math SOL) X Exit

Flag for Review

Question 21 of 37  
Section 1

Section Review Previous Next

**SAY** Which answer did you choose?

Pause for replies.

**SAY** You should have chosen C,  $y = -16.07x^2 + 105.13x + 3.6$ . Do you have any questions?

Answer all questions.

**SAY** Click *Next* at the bottom of the screen to go to question 22.

Pause.

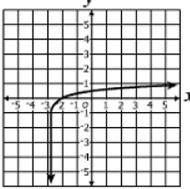
**SAY** Read the directions and question 22 to yourself then answer it.

Pause while students read and answer the question.

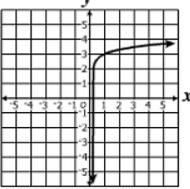
John doe  
Algebra II Practice Items (2009 Math SOL) X Exit

**Which graph could represent a function  $g(x) = \log(x) + c$  where  $c < 0$  ?**

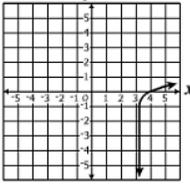
A



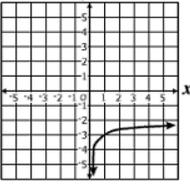
C



B



D



Flag for Review
Question 22 of 37  
Section 1
Section Review
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**SAY** Which answer did you choose?

Pause for replies.

**SAY** You should have chosen D. Do you have any questions?

Answer all questions.

**SAY** Click *Next* at the bottom of the screen to go to question 23.

Pause.

**SAY** Read the directions and question 23 to yourself then answer it.

Pause while students read and answer the question.

The screenshot shows a digital math practice interface. At the top, there is a toolbar with various icons for navigation and editing, and a user profile section for 'John Doe' with an 'Exit' button. The main content area contains the following text:

Which of the following is the inverse of  $g(x) = x^3 - 8$  ?

- A  $g^{-1}(x) = x + 2$
- B  $g^{-1}(x) = x - 2$
- C  $g^{-1}(x) = \sqrt[3]{x + 8}$
- D  $g^{-1}(x) = \sqrt[3]{x - 8}$

At the bottom of the interface, there is a navigation bar with a 'Flag for Review' button, the text 'Question 23 of 37 Section 1', a 'Section Review' button, and 'Previous' and 'Next' buttons.

**SAY** Which answer did you choose?

Pause for replies.

**SAY** You should have chosen C,  $g^{-1}(x) = \sqrt[3]{x + 8}$ . Do you have any questions?

Answer all questions.

**SAY** Click *Next* at the bottom of the screen to go to question 24.

Pause.

**SAY** Read the directions and question 24 to yourself then answer it.

Pause while students read and answer the question.

**SAY** Read the directions banner and the question to yourself, then answer the question. Be sure to follow the directions you are given when entering your answer.

John doe  
Algebra II Practice Items (2009 Math SOL) X Exit

**Directions: Type your answer in the box. Your answer must be in the form of an integer.**

The heights of 200 kindergarten students at T.E. Wright Elementary are normally distributed with a mean of 40 inches and a standard deviation of 1.8 inches. Approximately how many students have a height between 37.3 inches and 44.5 inches?

Students

Flag for Review Question 24 of 37 Section 1 Section Review Previous Next

**SAY Which answer did you type into the box?**

Pause for replies.

**SAY You could have entered 185 or 186. Do you have any questions?**

Teacher Note: The area under the curve between those two data points is 0.926983, and  $(0.926983)(200) = 185.396$ . If the student rounds the area to 0.93, then the estimated number of students is 186.

**SAY Click *Next* at the bottom of the screen to go to question 25.**

Pause.

**SAY Read the directions and question 25 to yourself then answer it.**

Pause while students read and answer the question.

John doe  
Algebra II Practice Items (2009 Math SOL) X Exit

Directions: Type your answer in the box. Your answer must be in decimal form.

Let  $g(x) = 2x^2 - 5$  and  $h(x) = \frac{x}{3} - 7$ . What is  $g(h(12))$ ?

**SAY** Which answer did you choose?

Pause for replies.

**SAY** The correct response is 13. Do you have any questions?

Answer all questions.

**SAY** Click *Next* at the bottom of the screen to go to question 26.

Pause.

**SAY** Read the directions and question 26 to yourself then answer it.

Pause while students read and answer the question.

The screenshot shows a digital math practice interface. At the top, there is a toolbar with various icons for navigation and editing, including a mouse pointer, eraser, highlighter, and a 'Help' button. The user's name 'John doe' and the page title 'Algebra II Practice Items (2009 Math SOL)' are visible in the top right corner. Below the toolbar, a grey box contains the directions: 'Directions: Click on the number line to select each value that is a solution to the equation. You must select all correct solutions.' The main area displays the equation: 'Graph the solutions to  $|\frac{1}{8}x - \frac{1}{4}| = \frac{1}{2}$ .' Below the equation is a horizontal number line with arrows at both ends, ranging from -10 to 10 with integer tick marks. At the bottom of the interface, there is a navigation bar with a 'Flag for Review' button, the text 'Question 26 of 37 Section 1', a 'Section Review' button, and 'Previous' and 'Next' navigation buttons.

**SAY** Which answer did you choose?

Pause for replies.

**SAY** You should have chosen -2 and 6 on the number line.

Since the number of correct answers was not indicated in the item, this item will show as “Answered” on the Section Review screen once one number is selected.

**Do you have any questions?**

Answer all questions.

Please note that additional information regarding the requirements for an item to appear as “Answered” on the Section Review screen within TestNav is located in Appendix B for reference.

**SAY** Before we go to the next question, let’s discuss the dot tool. Look at the toolbar at the top of the screen. Locate the dot tool (  ) that is directly to the left of the exhibit window. You can use this tool to place dots on the screen if using this tool would help you work through a problem. However, it is very important to note that you cannot use the dot tool to indicate an answer to any item.

If an item requires that a point or points be plotted on a number line or coordinate plane to answer a question, only the pointer tool can be used to plot the points. On the SOL test, points plotted with the dot tool will not be scored.

**SAY** To show you how this works, please use the eraser tool to remove the points you selected a moment ago. (Pause.) Now, click on the dot tool in the toolbar, and then use the dot tool to place several dots on the number line. Notice that these dots are large blue and look different than the points you plotted earlier with the pointer tool. These large blue dots can never be used to indicate an answer. Now click on the dot tool again to put the tool away. (Pause.)

Let's move to the Section Review by clicking on the Section Review button at the bottom of your screen. (Pause.) Scroll down to question 26, which is the number line item we are discussing now. (Pause.) The screen should indicate that question 26 is "Unanswered," even though there are dots on the number line. If you make a mistake during an actual SOL test and use the dot tool to plot a point instead of using the pointer tool to indicate your answer, the Section Review screen will remind you to return to that item and answer it. During testing, the Examiner will not be able to assist or remind you about how the tools work, so it is important that you understand this before testing.

We will discuss the Section Review screen and how it works when we reach the end of the practice items. Now, click on question 26 in the left column of the Section review screen to return to that item. (Pause.)

Take a moment to use the eraser tool to remove the dots, and then use the pointer tool to select the correct answers, -2 and 6.

Pause while students remove the dots and plot points with the pointer tool. Assist as necessary.

**SAY** To summarize, you must be very careful on the SOL test not to use the dot tool to answer a question. You must only use the pointer tool to answer the item. For a number line or coordinate plane item that requires you to plot a point or points to answer the question, if you plot points with the dot tool and not with the pointer tool, the item will show as "Unanswered" on the Section Review screen, as we have just seen.

Do you have any questions about the difference between correctly plotting your answer using the pointer tool and using the dot tool?

Answer all questions. Make sure that students understand that the dot tool cannot be used to answer a question. An item will show as unanswered on the Section Review screen if the student used the dot tool, rather than the pointer tool, to answer the question.

**SAY** Click *Next* at the bottom of the screen to go to question 27.

Pause.

**SAY** Read the directions banner and question 27 to yourself, then answer the question. Be sure to follow the directions you are given when entering your answer.

Pause while students read and answer the question.

Directions: Click on a box to choose each factor you want to select. You must select all correct factors.

The zeros of a cubic function  $f(x)$  are  $-1$ ,  $-\frac{2}{3}$ , and  $5$ . Select all of the factors of  $f(x)$ .

$(x - 1)$	$(3x + 2)$	$(x + 5)$
$(x + 1)$	$(3x - 2)$	$(x - 5)$

Question 27 of 37  
Section 1

Section Review

Previous Next

**SAY** Which answers did you choose?

Pause for replies.

**SAY** You should have chosen  $(x + 1)$ ,  $(3x + 2)$ , and  $(x - 5)$ .

Since the number of correct answers was not indicated in the item, this item will show as “Answered” on the Section Review screen once one number is selected.

**Do you have any questions?**

Answer all questions.

Please note that additional information regarding the requirements for an item to appear as “Answered” on the Section Review screen within TestNav is located in Appendix B for reference.

**SAY** Click *Next* at the bottom of the screen to go to the next question.

Pause.

**SAY** Read the directions banner and question 28 to yourself, then answer the question. Be sure to follow the directions you are given when entering your answer.

Pause while students read and answer the question.

John doe  
Algebra II Practice Items (2009 Math SOL) X Exit

Directions: Type your answer in the box. Your answer must be an integer.

A family reunion planning committee with 8 members plans to elect 3 officers – a president, treasurer, and historian. If each office is to be held by one person and no person can hold more than one office, in how many ways can those offices be filled?

**SAY** Which answer did you enter?

Pause for replies.

**SAY** You should have typed 336. Do you have any questions?

Answer all questions.

**SAY** Click *Next* at the bottom of the screen to go to the next question.

Pause.

**SAY** Read the directions banner and question 29 to yourself, then answer the question. Be sure to follow the directions you are given when entering your answer.

Pause while students read and answer the question.

John doe  
Algebra II Practice Items (2009 Math SOL) X Exit

Directions: Type your answer in the box. Round your answer to the nearest integer.

The volume of a container varies jointly with the square of its radius,  $r$ , and its height,  $h$ . The container has a height of 10 centimeters, a radius of 6 centimeters, and a volume of 377 cubic centimeters. What is the volume of a container with a radius of 4 centimeters and a height of 4 centimeters?

cm<sup>3</sup>

Flag for Review Question 29 of 37 Section 1 Section Review Previous Next

**SAY** Which answer did you enter?

Pause for replies.

**SAY** The correct answer is  $67 \text{ cm}^3$ . Do you have any questions?

Answer all questions.

**SAY** Click *Next* at the bottom of the screen to go to the next question.

Pause.

**SAY** Read the directions banner and question 30 to yourself, then answer the question. Be sure to follow the directions you are given when entering your answer.

Pause while students read and answer the question.

John doe  
Algebra II Practice Items (2009 Math SOL) X Exit

Directions: Place points on the  $x$ -intercepts of this graph. You must place points on each intercept.

Place points on the  $x$ -intercepts of this graph.

Flag for Review Question 30 of 37 Section 1 Section Review Previous Next

**SAY** Which answers did you choose?

Pause for replies.

**SAY** You should have plotted the points  $(-3,0)$ ,  $(-1,0)$ , and  $(2,0)$ .

Since the number of correct answers was not indicated in the item, this item will show as “Answered” on the Section Review screen once one point is selected with the pointer tool. If a point had been plotted using the dot tool and not with the pointer tool, the question would show as “Unanswered,” even if you had placed dots on the graph. Only the pointer tool can be used to indicate the answer to a question.

**Do you have any questions?**

Answer all questions. Make sure that students understand that the dot tool cannot be used to answer a question. An item will show as unanswered on the Section Review screen if the student used the dot tool, rather than the pointer tool, to answer the question.

Please note that additional information regarding the requirements for an item to appear as “Answered” on the Section Review screen within TestNav is located in Appendix B for reference.

**SAY** Click *Next* at the bottom of the screen to go to the next question.

Pause.

**SAY** Read the directions and question 31 to yourself then answer it.

Pause while students read and answer the question.

The screenshot shows a digital math practice interface. At the top, there is a toolbar with icons for a mouse, eraser, highlighter, red X, green checkmark, calculator, and a Help button. The user's name 'John doe' and the title 'Algebra II Practice Items (2009 Math SOL)' are visible in the top right corner. The main content area contains the following text: 'A solution to a quadratic equation is  $-16 - 8i\sqrt{35}$ . Which of these must also be a solution to this equation?'. Below this text are four radio button options: A  $16 - 8i\sqrt{35}$ , B  $-16 + 8i\sqrt{35}$ , C  $16 + 8i\sqrt{35}$ , and D  $-16 - 8i\sqrt{35}$ . At the bottom of the interface, there is a navigation bar with a 'Flag for Review' button, 'Question 31 of 37 Section 1', a 'Section Review' button, and 'Previous' and 'Next' navigation buttons.

**SAY** Which answers did you choose?

Pause for replies.

**SAY** You should have chosen B,  $-16 + 8i\sqrt{35}$ . Do you have any questions?

Answer all questions.

**SAY** Click *Next* at the bottom of the screen to go to the next question.

Pause.

**SAY** Read the directions and question 32 to yourself then answer it.

Pause while students read and answer the question.

Directions: Click and drag each selected expression to the correct box.

Assuming the denominator does not equal zero, completely simplify the following expression.

$$\frac{-2d^2 + d + 15}{9 - d^2} \div \frac{4d + 1}{2d^2 + 11d + 15}$$

Simplified Expression

<input type="text"/>	(-1)	(3 + d)	(2d + 5) <sup>2</sup>
<input type="text"/>	(3 - d)	(9 - d <sup>2</sup> )	(4d + 1)
	(d <sup>2</sup> + 9)	(2)	(2d - 5) <sup>2</sup>

Question 32 of 37  
Section 1

Flag for Review Section Review Previous Next

**SAY** Which answers did you choose?

Pause for replies.

**SAY** You should have chosen for the top box:  $(2d + 5)^2$  and for the bottom box:  $(4d + 1)$ .

In order for question 32 to show as “Answered” on the Section Review screen, you must have used at least two draggers. This is because there are two boxes indicating there should be at least one dragger used in the numerator and one dragger used in the denominator.

**Do you have any questions?**

Answer all questions. This question will show as “Answered” on the Section Review screen once the student uses two draggers. If the student places two draggers into the numerator or two draggers into the denominator, this question would still show as “Answered” on the Section Review screen, since the minimum number of draggers to show the question as answered is two. Any other number greater than two would hint or clue the answer.

Please note that additional information regarding the requirements for an item to appear as “Answered” on the Section Review screen within TestNav is located in Appendix B for reference.

**SAY** Click *Next* at the bottom of the screen to go to the next question.

Pause.

**SAY** Read the directions and question 33 to yourself then answer it.

Pause while students read and answer the question.

John doe  
Algebra II Practice Items (2009 Math SOL) X Exit

Directions: Click on a box to choose each expression you want to select. You must select the two correct expressions.

Identify each expression that is equivalent to  $\sqrt[6]{729q^{17}r^{11}}$ . Select the two answers that are correct.

$\frac{729}{6}q^{\frac{17}{6}}r^{\frac{11}{6}}$	$\frac{729}{6}q^{11}r^5$	$3q^{\frac{17}{6}}r^{\frac{11}{6}}$	$3q^{11}r^5$
$\frac{729}{6}q^{\frac{6}{17}}r^{\frac{11}{17}}$	$\frac{729}{6}q^2r^{\sqrt[6]{q^5r^5}}$	$3q^{\frac{6}{17}}r^{\frac{6}{11}}$	$3q^2r^{\sqrt[6]{q^5r^5}}$

Flag for Review Question 33 of 37 Section 1 Section Review Previous Next

**SAY** Which answers did you select?

Pause for replies.

**SAY** You should have chosen  $3q^{\frac{17}{6}}r^{\frac{11}{6}}$  and  $3q^2r^{\sqrt[6]{q^5r^5}}$ .

Since the directions and the question state that you must select two expressions, this item will only show as “Answered” on the Section Review screen once you choose two answers.

**Do you have any questions?**

Answer all questions.

Please note that additional information regarding the requirements for an item to appear as “Answered” on the Section Review screen within TestNav is located in Appendix B for reference.

**SAY** Click *Next* at the bottom of the screen to go to the next question.

Pause.

**SAY** Read the directions and question 34 to yourself then answer it.

Pause while students read and answer the question.

The screenshot shows a digital math practice interface. At the top, there is a toolbar with icons for a mouse, eraser, highlighter, red X, green checkmark, calculator, and a Help button. The user's name 'John doe' and the page title 'Algebra II Practice Items (2009 Math SOL)' are visible in the top right corner. The main content area contains the following text: 'Which expression is equivalent to the following expression if no denominators equal zero?'. Below this text is a complex fraction: 
$$\frac{\frac{-13+d}{42d^3}}{\frac{13-d}{6d^9}}$$
. Below the fraction are four multiple-choice options, each with a radio button:   
A  $\frac{-7}{d^3}$    
B  $\frac{-d^3}{7}$    
C  $\frac{7}{d^6}$    
D  $\frac{-d^6}{7}$    
At the bottom of the interface, there is a navigation bar with a 'Flag for Review' button, 'Question 34 of 37' and 'Section 1' text, a 'Section Review' button, and 'Previous' and 'Next' buttons.

**SAY** Which answers did you choose?

Pause for replies.

**SAY** You should have chosen D,  $\frac{-d^6}{7}$ . Do you have any questions?

Answer all questions.

**SAY** Click *Next* at the bottom of the screen to go to the next question.

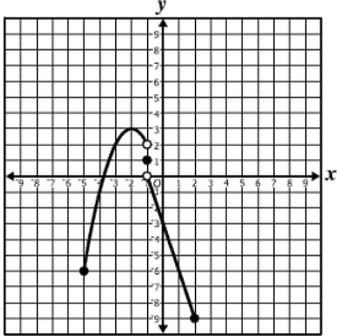
Pause.

**SAY** Read the directions and question 35 to yourself then answer it.

Pause while students read and answer the question.

John doe  
Algebra II Practice Items (2009 Math SOL) X Exit

The graph of a function is shown on the grid.



What appears to be the domain of this function?

A  $\{x \mid -9 \leq x \leq 3\}$

B  $\{x \mid -5 \leq x \leq 2\}$

C  $\{x \mid -5 \leq x \leq -1 \text{ and } -1 < x < 2\}$

D  $\{x \mid -9 \leq x \leq 0 \text{ and } 2 < x \leq 3\}$

Flag for Review Question 35 of 37 Section 1 Section Review Previous Next

**SAY** Which answer did you choose?

Pause for replies.

**SAY** You should have chosen B,  $\{x \mid -5 \leq x \leq 2\}$ . Do you have any questions?

Answer all questions.

**SAY** Click *Next* at the bottom of the screen to go to the next question.

Pause.

**SAY** Read the directions and question 36 to yourself then answer it.

Pause while students read and answer the question.

The screenshot shows a digital math practice interface. At the top, there is a toolbar with various icons for navigation and editing, and a user profile section for 'John doe' with an 'Exit' button. The main content area contains a question: 'Which of the following describes the end behavior of  $f(x) = 9 \log\left(\frac{2}{5}x\right) + 5$  as  $x$  approaches 0?' Below the question are four multiple-choice options, each with a radio button: A  $f(x)$  approaches  $-\infty$ , B  $f(x)$  approaches 0, C  $f(x)$  approaches 5, and D  $f(x)$  approaches  $\infty$ . At the bottom of the interface, there is a navigation bar with a 'Flag for Review' button, 'Question 36 of 37 Section 1', a 'Section Review' button, and 'Previous' and 'Next' buttons.

**SAY** Which answers did you choose?

Pause for replies.

**SAY** You should have chosen A,  $f(x)$  approaches  $-\infty$ . Do you have any questions?

Answer all questions.

**SAY** Click *Next* at the bottom of the screen to go to the next question.

Pause.

**SAY** Read the directions and question 37 to yourself then answer it.

Pause while students read and answer the question.

Directions: Click and drag each selected property to the correct box.

The steps used to simplify an algebraic expression are shown. Identify the missing properties.

Steps	Justification
$8i - 6 - 20 - 15i$	Given Expression
$-6 - 20 + 8i - 15i$	
$(-6 - 20) + (8i - 15i)$	
$(-6 - 20) + (8 - 15)i$	
$-26 - 7i$	Substitution Property

Associative Property of Addition	Distributive Property
Closure Property of Addition	Identity Property of Addition
Commutative Property of Addition	Inverse Property of Addition

Question 37 of 37  
Section 1

Flag for Review Section Review Previous Next

**SAY** Which answers did you choose?

Pause for replies.

**SAY** From top to bottom, the correct properties are:  
**Box 1: Commutative Property of Addition,**  
**Box 2: Associative Property of Addition, and**  
**Box 3: Distributive Property.**

In order for your answer to be correct, you must have selected the correct properties and placed each in the correct place. In order for this question to show as “Answered” on the Section Review screen, each of the boxes must contain a property.

**Do you have any questions?**

Answer all questions.

Please note that additional information regarding the requirements for an item to appear as “Answered” on the Section Review screen within TestNav is located in Appendix B for reference.

If you would like your students to practice using the Help tool (as mentioned on page 9), they can do so now.

**SAY** Click *Next* at the bottom of the screen to go to the Section Review screen.

Return to Test

### Section 1 Review

Choose an item below or click *CONTINUE* to go to the Test Overview.

All Items	1 Flagged for Review	39 Answered	0 Unanswered
Sample		✓ Answered	
Sample		✓ Answered	
Question 1		✓ Answered	
Question 2		✓ Answered	
Question 3		✓ Answered	
Question 4		✓ Answered	
Question 5		✓ Answered	
Question 6		✓ Answered	
Question 7		✓ Answered	
Question 8	🚩 Flagged for Review	✓ Answered	
Question 9		✓ Answered	
Question 10		✓ Answered	

CONTINUE
TO TEST OVERVIEW
▶

john doe | Algebra II Practice Items (2009 Math SOL)

**SAY** The Section Review screen shows which questions have been answered, which questions have not been answered and which questions you have flagged for review. To return to a question, click on the question number.

Practice returning to a question by clicking on question #8, the question we flagged for review. You should see a picture of a flag in the “Flagged for Review” column next to the question. (Pause.) You can then return to this screen by clicking on the “Section Review” button at the bottom of the screen on question #8.

Pause while students practice returning to question #8 and then come back to this screen.

**SAY** You can also use the Section Review screen to sort the questions. The top row of the Section Review screen tells you how many questions you have flagged for review, answered, or left unanswered. If you want to view only the questions you Flagged for Review, simply click on the column header that says “Flagged for Review.” If you want to view only questions you have answered, click the “Answered” header. If you want to view only questions you left unanswered, click on the header that says “Unanswered.” Move your pointer over each column heading and notice how that section of the heading changes.

Pause while students practice sorting the columns

**SAY** If the Section Review screen indicates that a question is unanswered, you have not answered a question completely. If this happens, it is a good idea to return to the question, and read the directions and the question again before making any changes to your answer.

**Are there any questions?**

Students should check any questions that show as “*Unanswered*” on the Section Review screen. When the student returns to the question he or she may see that there is an answer, but it may be incomplete. It is important to note, however, that some questions will show as answered once a student responds with a single answer. This is necessary at times to avoid hinting or cluing an answer. For example, hot spot items that require students to “Select All” fall into this category. Please see Appendix B for detailed information.

**SAY To get back to the Section Review screen that lists all questions and the status of each, click the top left-hand column header, titled “\_ of 39 Total Items.”**

Please note the number of total items above (39) includes the two sample questions at the beginning of this practice set and the 37 practice items. The blank number will vary, depending on the column the student filters on last.

**SAY We are going to review two more screens. Click on the “Continue to Test Overview” button on the lower left corner of the screen. (Pause.)**

Algebra II Practice Items (2009 Math SOL)

Choose a section below or click *SUBMIT* to submit and exit the test.

SECTIONS	STATUS	QUESTIONS
Section 1	Opened	1-37

**SUBMIT**  
AND EXIT TEST

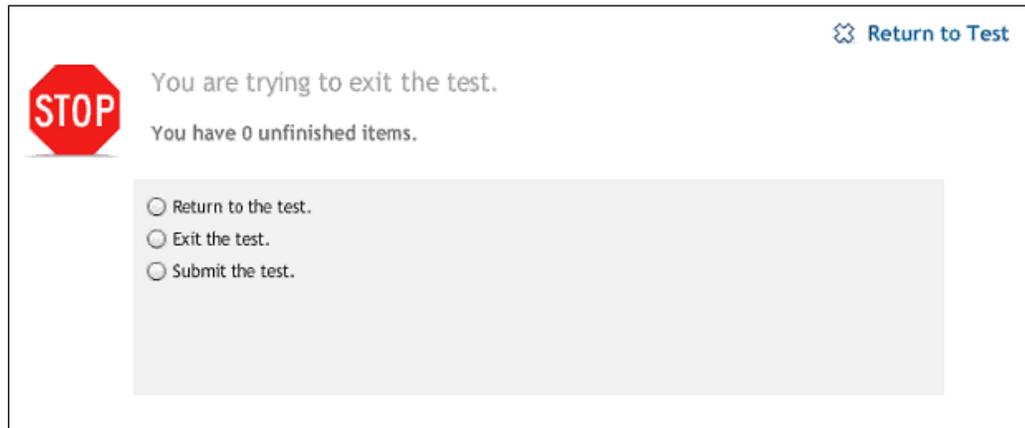
john doe

Exit Test X

**SAY From the Test Overview screen, you can return to the test or move to the final screen. Clicking on Section 1 will take you to the last practice item you were working on or went back to review. Since we have finished with the practice items, we will not return to any question within the section. Clicking on the “Submit and Exit Test” button at the bottom of the screen will move you to the final screen. Are there any questions? (Pause to answer all questions.)**

**Now click on “Submit and Exit Test.” (Pause.)**

**You will see a stop sign with three choices. It is important to review these three choices. (Pause.)**



**SAY** Notice this screen indicates the number of unfinished items you have on the test.

The first choice states, “*Return to the test.*” This option allows you to go back to the practice questions. You would click this option if you wanted to return to any of the questions. Selecting this would first take you to the screen we just reviewed, and then you would click on Section 1 to return to the practice items.

The second choice states, “*Exit the test.*” This option should NOT be chosen. This option may be used during actual SOL testing, but should NOT be used for this practice set. If you click on this option, you will lose all of your work. It will not be saved.

Pause and make sure students understand not to choose option 2. During actual SOL testing, students may be directed to choose this option if they are being moved to a different location to complete their tests or if they need to leave the testing environment (while monitored) for a short time.

**SAY** The third choice, “*Submit the test,*” allows you to submit your answers.

Once you have finished using these practice items, proceed with exiting the application.

**SAY** Since we have finished with the practice items, please click on the third option, “*Submit the test.*” Next, click on the green button that says “*Final submit.*” When you click this button during actual SOL testing, your test will be submitted for scoring and you will not be able to return to the test.

**SAY** This completes our review of the Algebra II SOL Mathematics Practice items.

Thank you for reviewing the Algebra II Practice Items with your students.

**APPENDIX A****Answers to Algebra II Practice Items****Sample A**

The correct answer is C,  $\frac{\sqrt{7x}}{4}$

**Sample B**

The correct answer is 81.

**Question 1**

The correct answer is D,  $\{ \}$ , the empty set.

**Question 2**

The correct answer is C,  $y = -26$  and  $y = -11$ .

**Question 3**

The correct answer is B,  $f(x) = \frac{8}{x-3}$ .

**Question 4**

The correct answer is C, one  $x$ -intercept and no  $y$ -intercept.

**Question 5**

The correct answer is D,  $y$  approaches 0.

**Question 6**

The correct answer is B,  $y = 997(1.03)^x$ .

**Question 7**

The correct answer is D, 59.

**Question 8**

The correct properties, from top to bottom, are:

1st box: Distributive Property

2nd box: Commutative Property of Addition

3rd box: Associative Property of Addition

**Question 9**

$a_3 = 47$ .

**Question 10**

$g(x) = x^2 + 2x - 3$  and  $k(x) = \sqrt{x} - 4$  Both of these functions, and only these functions, must be selected.

**Question 11**

$-\infty < x < -1$  and  $2 < x < \infty$ . Both of these intervals, and only these intervals, must be selected.

**Question 12**

Horizontal Asymptote:  $y = 4$

Vertical Asymptote:  $x = 3$

**APPENDIX A (Continued)****Answers to Algebra II Practice Items****Question 13**

The correct answer is 63.

**Question 14**

The correct answer is B,  $-\infty < x < -1$ .

**Question 15**

One of the combinations of:

the regions between 76.0 and 78.5 and between 78.5 and 81.0, or  
the regions between 76.0 and 78.5 and between 81.0 and 83.5, or  
the regions between 78.5 and 81.0 and between 83.5 and 86.0, or  
the regions between 81.0 and 83.5 and between 83.5 and 86.0.

**Question 16**

The correct answer is  $\frac{5}{2}$  (entered on the keyboard as *five forward slash two, 5/2*) or 2.5.

**Question 17**

$f(x) = \frac{-3}{x^2}$  and  $f(x) = \frac{3}{(x+1)^2}$  Both of these functions, and only these functions, must be selected.

**Question 18**

The correct answers are -1 and 3.25. Both of these values, and only these values, must be selected.

**Question 19**

The correct answer is B,  $(5m - 7)(25m^2 + 35m + 49)$ .

**Question 20**

The correct answer is A,  $4n^2p^9\sqrt[3]{9n^2}$ .

**Question 21**

The correct answer is C,  $y = -16.07x^2 + 105.13x + 3.6$ .

**Question 22**

The correct answer is D.

**Question 23**

The correct answer is C,  $g^{-1}(x) = \sqrt[3]{x + 8}$

**Question 24**

The correct answer is 185 or 186.

**Question 25**

The correct answer is 13.

**APPENDIX A (Continued)**

**Answers to Algebra II Practice Items**

**Question 26**

The correct answer is -2 and 6.

**Question 27**

The correct answer is  $(x + 1)$ ,  $(3x + 2)$ , and  $(x - 5)$ .

**Question 28**

The correct answer is 336.

**Question 29**

The correct answer is  $67 \text{ cm}^3$ .

**Question 30**

The correct answers are  $(-3,0)$ ,  $(-1,0)$ , and  $(2,0)$ .

**Question 31**

The correct answer is B,  $-16 + 8i\sqrt{35}$ .

**Question 32**

The top box should have:  $(2d + 5)^2$  and the bottom box should have:  $(4d + 1)$ .

**Question 33**

The correct answers are chosen  $3q^{\frac{17}{6}}r^{\frac{11}{6}}$  and  $3q^2r\sqrt[6]{q^5r^5}$ .

**Question 34**

The correct answer is D,  $\frac{-d^6}{7}$ .

**Question 35**

The correct answer is B,  $\{x \mid -5 \leq x \leq 2\}$ .

**Question 36**

The correct answer is A,  $f(x)$  approaches  $-\infty$ .

**Question 37**

The correct answer is Counting from top to bottom, Box 1 = Commutative Property of Addition, Box 2 = Associative Property of Addition, Box 3 = Distributive Property

## **APPENDIX B**

An overview of how student responses to technology-enhanced items will appear on the Section Review screen is outlined below:

### **Fill-in-the-blank (FIB) Items**

For all fill-in-the-blank items, when a student enters any character into the response box, the item will show as answered on the Section Review screen. If a student enters an answer, and then completely erases that answer from the fill-in-the-blank box, the item will show as unanswered on the Section Review screen.

### **Histogram or Bar Graphing Items**

For all histogram or bar graphing items, when a student raises any bar, the item will show as answered on the Section Review screen. If the student moves all bars back down to the original heights, the item will show as unanswered on the Section Review screen.

### **Hot Spot Items**

When the number of correct responses is indicated in the directions or in the item itself, the item will show as answered on the Section Review screen only when the student selects that number of hot spots. For example, if the student is directed to select three answers, then the Section Review screen will show unanswered if the student selects one or two answers and will only show as answered once the student has selected three answers. If the number of correct responses is not indicated in the directions or in the question itself, then the item will show as answered on the Section Review screen once the student selects one answer. For example, if the student is required to “Select all correct answers,” the item will show as answered once the student selects one answer option. In this case, it is assumed that the student thought there was only one correct answer. This practice avoids providing information as to how many correct answers there are in the “select all” hot spot items.

### **Number Line or Coordinate Plane Items**

Many number line or coordinate plane items require the student to plot one or more points as the response. When the number of points necessary to answer the item is indicated in the directions or the item itself, the item will show as answered on the Section Review screen only when the specified number of points has been plotted. When the directions or the item do not specify the number of points to plot, the item will show as answered on the Section Review screen once the student plots one point. Only points that have been plotted with the pointer tool are scorable responses. Points plotted with the dot tool are not scorable responses. If a student answers a question with the dot tool, the question will show as unanswered on the Section Review screen.

## **APPENDIX B (Continued)**

### **Drag and Drop Items**

Drag and drop items contain answer receptacles called “bays” and “dragers” that the student moves into the bays to answer the question. There are many types of drag and drop items, and each item is evaluated individually so that the student is given the most detailed information possible on the Section Review screen, without providing hints as to the correct answer. For items with a specified number of bays, the item will show as answered on the Section Review screen once the student uses that number of dragers. For example, if there are three bays and it is intended for a dragger to be placed into each bay, then the Section Review screen will show the item as answered once three dragers have been input by the student. Or, in another example, if the directions or question indicate that all dragers need to be used to answer the item, then the item will show as answered on the Section Review only when all dragers have been used. If the number of dragers necessary to answer the question is not indicated, such as an item that requires the use of a dragger to complete a model or pictograph, then the Section Review Screen will show the item as answered once the student places one dragger in a bay.