

Practice Item Guide

Virginia Standards of Learning

End of Course
Algebra I

Revised March, 2011
Pearson

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OVERVIEW

Items measuring the new 2009 *Mathematics Standards of Learning* (SOL) will be field-tested in spring 2011 and will become operational in the 2011-2012 school year. In preparation for the implementation of items measuring the content in the 2009 Mathematics SOL, practice items are being provided to school divisions. These practice items provide examples of the new content and increased rigor represented by the 2009 SOL and illustrate the new Technology-Enhanced Item (TEI) types. Technology-Enhanced Items are items which are presented in various formats that allow students to indicate their responses in ways other than multiple-choice format.

Please note that the practice items are not intended to be a complete test and are not intended to cover all mathematics content for the grade level or course. Furthermore, while the practice items provide examples of some TEI, they are not intended to represent all types of functionality associated with these item types.

Students will have the opportunity to practice these items via an online electronic Practice Assessment Tool (ePAT). The ePAT is a stand-alone program that simulates an online SOL assessment without requiring an internet connection. Except for the process of entering appropriate authentication information (login ID, password, test code), the ePAT application will closely simulate the TestNav™ SOL assessment experience. This practice guide may be used by teachers or other adults to guide students through the practice items for End of Course Algebra I. While the use of this guide with the practice items is not required, it is strongly encouraged, as it will help to ensure that students are familiar with the types of items that they may encounter.

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.

When the student is finished with the practice item set, the student may close it by clicking *Save and Exit* or *Submit* on the bottom of the Item Review screen. Both buttons will produce a series of prompts to close the application. Directions read aloud to the students will tell them to use the *Submit* button. The practice items will not be scored; however, the correct answers are provided in this guide with each question.

NEW TECHNOLOGY-ENHANCED ITEM TYPES

The SOL practice items for End of Course Algebra I will introduce four new Technology-Enhanced Item types: drag and drop, hot spot, short response, and graphs. A brief description of each is provided.

Drag and Drop

Drag and drop items contain draggers and drop zones.

- Draggers are the answer options that are moved to drop zones in response to the question.
- Drop zones 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 drop zone(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.

Hot Spot

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

- Hot spot zones are answer options which may be objects, graphic elements, or text labels which are selected in response to a question.
- **Unlike a traditional multiple-choice item where only one answer option is correct, hot spot items will require the student to select one or more hot spot zones (answer options) in order to correctly answer the item.**

The student selects a hot spot by clicking on it. There will be an indication on the screen, such as the zone being outlined in orange or a red star, which confirms that a hot spot zone has been selected.

Short Response

Short response items contain a text entry field. For this item type, the student responds to a question by typing a response into a blank box that is 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.
- A response typically is no more than six characters long.
- Students should carefully follow directions on short response items, such as providing an answer in simplest form, or rounding a number as indicated.

Graphs

Graphing items require students to create or complete some type of graph. The graphs presented will vary by grade or course level. Bar graph items allow students to set the height or length of a bar. The student's response is indicated by the height or length of the bar(s) in relation to the image/graph. If the orientation of the bar is vertical, the student can click above or below a location to change the height of the bar. If the orientation of the bar is horizontal, the student can click to the left or right of a location to shorten or lengthen the bar. The bar will move to the location where the student clicks.

Some items require the student to graph point(s) on a line, grid, or image. The student's response is the location of the point(s) in relation to the line, grid, or image. These types of items may include graphing points on a number line, graphing ordered pairs on a grid, or graphing inequalities.

INSTALLING THE ePAT LAUNCHER

If the computer being used to take the SOL practice item set already has the ePAT Launcher installed, please proceed to page 8. For computers without the ePAT Launcher previously installed or if you are unsure whether the ePAT launcher has been installed, continue with the steps below. Work with your technology staff in your school division if you are unable to install software on a computer in your school. Administrative access to the computer may be needed. Further instructions for installing the ePAT Launcher can be found under the “Resources” tab on the PearsonAccess website listed in step 1.

1. Go to the Virginia PearsonAccess website:
<http://www.pearsonaccess.com/cs/Satellite?c=Page&childpagename=Virginia/vaPALPLLayout&cid=1175826755281&pagename=vaPALPWrapper>
2. Under the “ePAT Launcher” heading, click the “Install Launcher (Windows)” or “Install Launcher (Mac Intel)” link depending on the type of computer workstation being used.

**Practice Assessment Tools**
ePat Launcher
Make sure you download and install the ePat Launcher before using the tools listed below.

- [Install Launcher \(Windows\)](#)

OR

**Practice Assessment Tools**
ePat Launcher
Make sure you download and install the ePat Launcher before using the tools listed below.

- [Install Launcher \(Mac Intel\)](#)

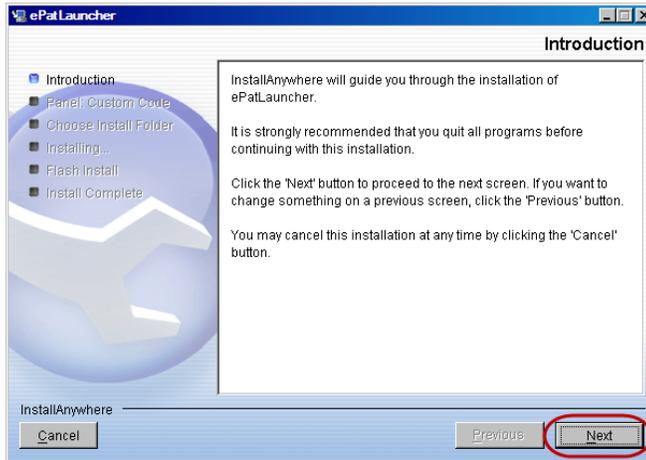
3. Click “Run” to continue. The file will start to download.



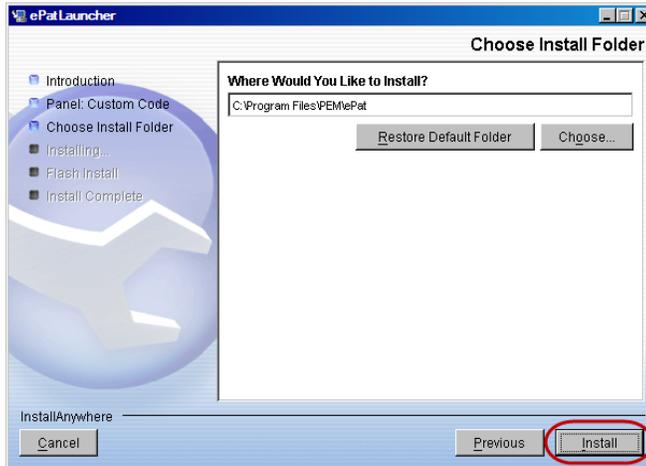
4. When the download is complete, click “Run” to continue.



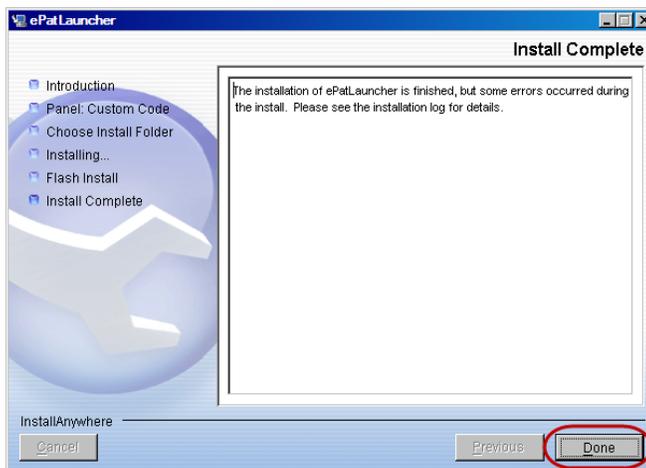
5. The ePAT Launcher installation will begin. Click “Next” to continue.



6. Choose an install folder and then click “Install” to continue.



7. The installation begins. When the install is complete, click “Done.”



DOWNLOADING VASOL MATH PRACTICE ITEMS

1. Go to the Virginia Department of Education website:
<http://www.doe.virginia.gov/instruction/mathematics/resources.shtml>
2. Under the heading “Standards of Learning Assessment Resources” click on “SOL Practice Items and Practice Item Guides.”
3. Click on the specific practice item set you wish to download. Download the items compatible with your computer’s operating system.
4. Click “Run” to continue. The file will start to download.
5. When the download is complete, click “Run” to continue.
6. The ePAT installation will begin. Click “Next” to continue.
7. Choose an install folder and then click “Install” to continue.
8. The installation will begin. When the install is complete, click “Done.”
9. If you wish to download additional practice items, return to step 2 above.

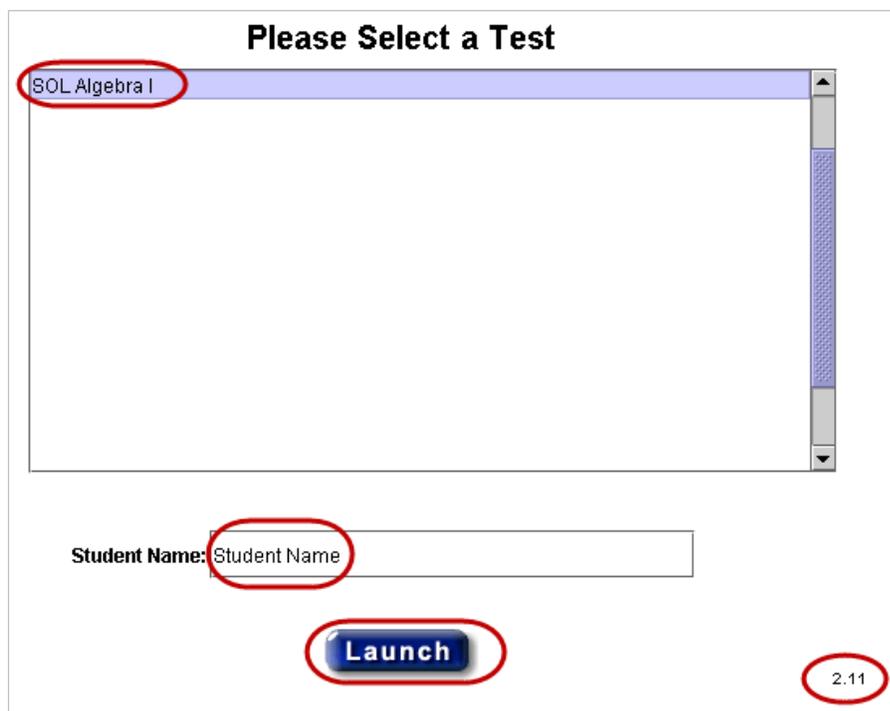
START THE ePAT LAUNCHER

Desktop Icon

1. Double-click the ePAT Launcher icon on the workstation desktop to start the program.



2. Check the version number in the bottom right corner of the screen. If the version number is anything other than 2.11, you will need to install the latest version of the ePAT Launcher. Refer to the “INSTALLING THE ePAT LAUNCHER” section on page 5 for instructions on how to do this.
3. Click the “SOL Algebra I” practice item set to highlight it.
4. Complete the Student Name field.
5. Click the “Launch” button.
6. Go to the appropriate section in this guide for the practice item set directions.



MATERIALS NEEDED FOR COMPLETING VASOL PRACTICE ITEMS

End of Course Algebra I: Scratch paper, pencil and hand-held graphing calculator.

ONLINE TOOLS AVAILABLE FOR COMPLETING ITEMS

Eliminate Choice – Use the eliminate choice tool to mark choices that you do not wish to consider.

Highlighter – Use the highlighter tool to highlight text or graphics.

Straightedge – Use the straightedge tool to draw straight lines.

Eraser – Use the eraser to remove lines or highlights.

Ruler – Use the ruler tool to measure something on screen.

Exhibits – Use the Exhibits tool to access the Algebra I formula sheet.

Additional information and demonstrations of each tool on the toolbar can be found by clicking the  question mark symbol located at the top of the ePAT screen. To display help on a specific tool, click the tool name in the drop-down list.

SPECIFIC DIRECTIONS FOR THE SOL END OF COURSE ALGEBRA I PRACTICE ITEMS

Introduction

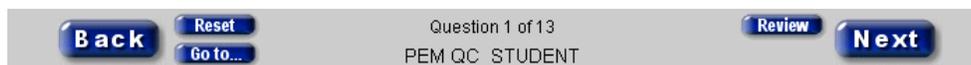
After the practice items are launched, the first practice item will be displayed. Read the following instructions to the students.

SAY Today you will be working on some End of Course Algebra I practice items for the Virginia Standards of Learning assessment. There are 13 questions that will show you some of the types of test items that will be administered as part of the new mathematics assessments. Listen carefully as I read the directions for these practice items. I will guide you through each item one at a time. Some questions will be multiple choice and some questions will require you to show your answer in another way, such as typing your answer in a box or clicking and dragging your answer to a specific location. Please remember that the questions you will see are practice questions. They will not be scored, but I will tell you the answer for each question.

Do you have any questions before we start?

Pause to answer questions.

SAY Navigation buttons appear at the bottom of the screen for each question. If you do not see the navigation buttons, you need to scroll down to reveal them. A scroll bar will appear on the right side of the window. Notice that the question numbers are also located at the bottom of the screen. For example, the screen with the first question reads “Question 1 of 13.”



SAY Notice the buttons located at the bottom of the screen.

Pause to review the buttons in the chart below with the students.

Button	Purpose
<i>Next</i>	Goes to the next screen
<i>Back</i>	Goes back a screen
<i>Reset</i>	Clears your answer choice
<i>Review</i>	Marks the question so you can go back and look at it again
<i>Go To</i>	Goes to a review screen

SAY At any time during the administration of the practice items, you may click on the *Review* button located at the bottom of the screen to select that question to review later. When you reach the end of the practice items, there will be a review screen. It will show you which questions you have not answered and which questions you have marked for review.

Look at question 1 on your screen.

Check to see that the students are looking at the first question.

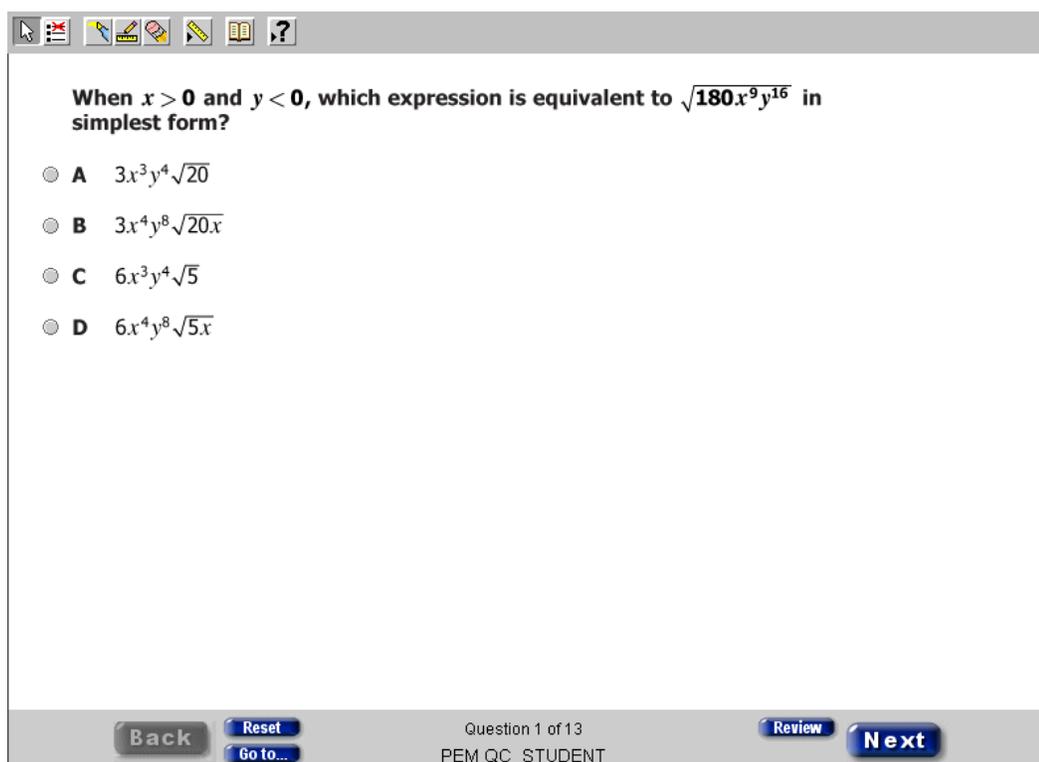
SAY Some of the tools you can use are in the toolbar at the top of the screen. Information about each tool on the toolbar is available by clicking the question mark symbol (). Click on the question mark symbol now. To display help on a specific tool, click the tool name in the drop-down list. Take a moment to click on the different tools. You will have an opportunity to use these tools while you work through the practice items.

Pause while students explore the tools on the toolbar. Offer assistance, as needed.

SAY Read question 1 to yourself.

If a student's IEP provides for a read-aloud accommodation, then all questions should be read to the student.

Pause while students read the question.



The screenshot shows a math practice interface. At the top is a toolbar with icons for a mouse, a list, a pencil, an eraser, a highlighter, a calculator, a book, and a question mark. Below the toolbar is a question: "When $x > 0$ and $y < 0$, which expression is equivalent to $\sqrt{180x^9y^{16}}$ in simplest form?" There are four multiple-choice options: A $3x^3y^4\sqrt{20}$, B $3x^4y^8\sqrt{20x}$, C $6x^3y^4\sqrt{5}$, and D $6x^4y^8\sqrt{5x}$. At the bottom of the interface are buttons for "Back", "Reset", "Go to...", "Question 1 of 13", "Review", and "Next". The text "PEM QC STUDENT" is visible at the bottom center.

SAY Decide which answer is correct. At the top of the toolbar, click on the second button, the one with the red X (). This is called the eliminate choice tool. Selecting this tool will change your cursor 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, click the choice you believe is not correct.

Pause while students practice using this tool.

When $x > 0$ and $y < 0$, which expression is equivalent to $\sqrt{180x^9y^{16}}$ in simplest form?

A ~~$3x^3y^4\sqrt{20}$~~ 

B $3x^4y^8\sqrt{20x}$

C $6x^3y^4\sqrt{5}$

D $6x^4y^8\sqrt{5x}$

Back Reset Go to... Question 1 of 13 Review Next
PEM QC STUDENT

SAY Click the eliminate choice tool icon again to put the tool away.

Wait for students to put the tool away.

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 a red X.

Pause while students practice using this tool.

When $x > 0$ and $y < 0$, which expression is equivalent to $\sqrt{180x^9y^{16}}$ in simplest form?

A $3x^3y^4\sqrt{20}$
 B $3x^4y^8\sqrt{20x}$
 C $6x^3y^4\sqrt{5}$
 D $6x^4y^8\sqrt{5x}$

Question 1 of 13
PEM QC STUDENT

Back Reset Go to... Review Next

SAY Click on the eraser tool icon to put it away. Now click on the answer you have chosen.

Pause while students work to find the answer to the question.

SAY Which answer did you choose?

Pause for replies.

SAY The correct answer is D. Click on the circle next to choice D to select this as your answer.

Do you have any questions about how to select an answer, use the eliminate choice tool, or use the eraser?

Answer questions about how to click to select an answer or use the tools. Since these are practice items, it is acceptable to give assistance or discuss how to find the correct answer to any question.

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

Wait for students to click *Next*. Check to see that the students are looking at the correct question.

SAY Read question 2 to yourself.

Pause while students read the question.

Frank works at a convenience store.

- He earns \$7.50 per hour when he works during the day.
- He earns \$12.50 per hour when he works at night.
- He wants to earn at least \$300 per week.

Which graph best represents this situation?

Frank's Weekly Earnings

A

Frank's Weekly Earnings

C

Frank's Weekly Earnings

B

Frank's Weekly Earnings

D

Question 2 of 13

PEM QC STUDENT

SAY You can use the highlighter tool on the toolbar to highlight text. To select this tool, click the icon that looks like a yellow highlighter (). Selecting the highlighter tool will change your cursor to an arrow with a highlighter next to it. Practice using the highlighter by highlighting the question above the graphs. Click again on the highlighter tool on the toolbar to put the tool away.

Determine which graph is the best answer. Then click on the answer you have chosen.

Pause while students practice using the highlighter tool and work to find the answer to the question.

Frank works at a convenience store.

- He earns \$7.50 per hour when he works during the day.
- He earns \$12.50 per hour when he works at night.
- He wants to earn at least \$300 per week.

Which graph best represents this situation?

Frank's Weekly Earnings

A

Frank's Weekly Earnings

C

Frank's Weekly Earnings

B

Frank's Weekly Earnings

D

Question 2 of 13
PEM QC STUDENT

Back Reset Go to... Review Next

SAY Which answer did you choose?

Pause for replies.

SAY The correct answer is graph C. Do you have any questions about selecting the correct answer or using the highlighter tool?

Answer all questions.

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

Wait for students to click *Next*. Check to see that the students are looking at the correct question.

SAY Read question 3 to yourself.

Pause while students read the question.

A function f is described.

- $f(x) = (x - 2)^2 + 3$
- The domain of f is all real numbers greater than 0.

The range of f is all real numbers greater than or equal to —

A 2
 B 3
 C 5
 D 7

Back Reset Go to... Question 3 of 13 Review Next
 PEM QC STUDENT

SAY Determine which answer is correct. Click on the answer you have chosen.

Pause while students work to find the answer to the question.

SAY Which answer did you choose?

Pause for replies.

SAY The correct answer is B, 3. Do you have any questions?

Answer all questions.

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

Wait for students to click *Next*. Check to see that the students are looking at the correct question.

SAY Read question 4 to yourself.

Pause while students read the question.

An experiment is conducted on a container of gas that is kept at a constant temperature.

- When the pressure on the gas is 30 pounds per cubic inch, the volume is 120 cubic inches.
- When the pressure on the gas is 40 pounds per cubic inch, the volume is 90 cubic inches.
- Let p represent the pressure on the gas.
- Let v represent the volume of the gas.

Which statement is true about this relationship?

- A The volume of the gas varies directly with the pressure because $v = 4p$.
- B The volume of the gas varies directly with the pressure because $vp = 3,600$.
- C The volume of the gas varies inversely with the pressure because $v = 4p$.
- D The volume of the gas varies inversely with the pressure because $vp = 3,600$.

Question 4 of 13
PEM QC STUDENT

Buttons: Back, Reset, Go to..., Review, Next

SAY Determine which answer is correct. Click on the answer you have chosen.

Pause while students work to find the answer to the question.

SAY Which answer did you choose?

Pause for replies.

SAY The correct answer is D. Do you have any questions?

Answer all questions.

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

Wait for students to click *Next*. Check to see that the students are looking at the correct question.

SAY Read question 5 to yourself.

Pause while students read the question.

The data set shown has a mean of 37 and a standard deviation of 6.3, rounded to the nearest tenth.

{ 26, 29, 32, 33, 35, 36, 37, 39, 40, 44, 45, 48 }

How many of these data points have a z-score greater than -0.6

Given:

- x represents an element of the data set,
- x_i represents the i^{th} element of the data set,
- n represents the number of elements in the data set,
- μ represents the mean of the data set, and
- σ represents the standard deviation of the data set.

$$\text{z-score } (z) = \frac{x - \mu}{\sigma}$$

A 3
 B 5
 C 8
 D 9

Back Reset Go to... Question 5 of 13 Review Next
 PEM QC STUDENT

SAY Notice that question 5 contains a formula box. Click on the Exhibit tool () on the tool bar to view the Algebra I formula sheet. Notice that the formula in the box is not on this formula sheet. Any formulas that you may need to solve a problem, which are not on the formula sheet, will be provided in a formula box. Some items will be presented this way in the new mathematics tests.

This particular formula box gives you one formula, while other items may have a box that contains more than one formula. Sometimes you will not need all of the information or formulas provided within the box, and will have to choose which information is useful in order to solve a problem.

The “Given” and formula are presented in the same format as the new (2009 *Mathematics Standards of Learning*) formula sheet. Some of the variables that are defined are not used in this particular formula, but will be used in other formula boxes that contain statistics formulas.

The data set shown has a mean of 37 and a standard deviation of 6.3, rounded to the nearest tenth.

{ 26, 29, 32, 33, 35, 36, 37, 39, 40, 44, 45, 48 }

How many of these data points have a z-score greater than -0.6

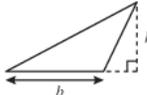
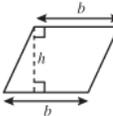
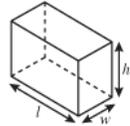
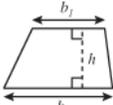
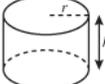
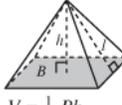
Given:

x represents an element of the data set,
 x_i represents the i^{th} element of the data set,
 n represents the number of elements in the data set,
 μ represents the mean of the data set, and
 σ represents the standard deviation of the data set.

$$\text{z-score } (z) = \frac{x - \mu}{\sigma}$$

Algebra I Formula Sheet

Geometric Formulas

 $A = \frac{1}{2}bh$	 $A = bh$	 $V = lwh$ $S.A. = 2(lw + lh + wh)$	 $V = \frac{1}{3}\pi r^2h$ $S.A. = \pi r(l + r)$
 $p = 4s$ $A = s^2$	 $A = \frac{1}{2}h(b_1 + b_2)$	 $V = \pi r^2h$ $S.A. = 2\pi r(h + r)$	 $V = \frac{1}{3}Bh$ $S.A. = \frac{1}{2}lp + B$
 $p = 2(l + w)$ $A = lw$	 $C = 2\pi r$ $A = \pi r^2$	 $c^2 = a^2 + b^2$	

Abbreviations **Pi**

SAY Click the X in the upper right corner of the Exhibit window to put the formula sheet away.

Pause while students put the tool away.

SAY Decide which is the correct answer for this problem, and click on your answer. You may use the tools we have practiced: the eliminate choice, eraser, and highlighter.

Pause while students work to find the answer to the question.

SAY Which answer did you choose?

Pause for replies.

SAY The correct answer is C, 8. Do you have any questions?

Answer all questions.

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

Wait for students to click *Next*. Check to see that the students are looking at the correct question.

SAY Read question 6 to yourself.

Pause while students read the question.

The screenshot shows a digital test interface. At the top, there is a toolbar with icons for navigation and help. The main content area contains the following text:

The number of points two basketball teams scored is summarized in these box-and-whisker plots.

Points Scored

Team A

Team B

The plots are on a number line from 20 to 80. Team A's plot has a minimum at 30, a first quartile at 55, a median at 60, a third quartile at 65, and a maximum at 70. Team B's plot has a minimum at 40, a first quartile at 50, a median at 55, a third quartile at 60, and a maximum at 65.

• Team A scored a different number of points in each of the team's 14 games.

• Team B scored a different number of points in each of the team's 13 games.

What is the total number of games that Team A and Team B scored 55 or more points?

A 13
 B 14
 C 16
 D 18

At the bottom, there are buttons for "Back", "Reset", "Go to...", "Review", and "Next". The footer indicates "Question 6 of 13" and "PEM QC STUDENT".

SAY Determine which answer is correct. Click on the answer you have chosen.

Pause while students work to find the answer to the question.

SAY Which answer did you choose?

Pause for replies.

SAY The correct answer is D, 18. Do you have any questions?

Answer all questions.

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

Wait for students to click *Next*. Check to see that the students are looking at the correct question.

SAY Let's read question 7 together. Notice that question 7 is not a traditional multiple-choice item, but one that will require you to select one or more answers.

The question is located on the left side of your screen. A directions box is on the right side of your screen. The directions box contains information on how to answer the question and may give you specific information on how to represent your answer. Always read the directions in the directions box before solving the problem.

The answer choices are located within the dark gray box underneath the question.

Identify each function that has exactly one zero.

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

$f(x) = 9x^2 - 4$
 $g(x) = 9(x - 8)$
 $h(x) = x^2 + 4x + 8$
 $j(x) = x^2 - 8x + 16$
 $k(x) = -2(x + 4)(x + 1)$

Back Reset Go to... Question 7 of 13 Review Next
 PEM QC STUDENT

SAY The directions say, “Click on the box to choose each function you want to select. You must select all correct functions.” There may be one correct answer or multiple correct answers to this item. In order to get the item correct, you must choose all correct answers, and only those answers.

The item asks you to identify each function that has exactly one zero. Look at each function in the dark gray box to determine if it has exactly one zero. Be sure to select each function that you want to be considered as correct. To select a function, place the cursor over the white box and then click once.

An orange outline will appear around the box to show that you have selected the function in that box as an answer.

Pause while students select the correct answer or answers.

Identify each function that has exactly one zero.

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

$f(x) = 9x^2 - 4$
 $g(x) = 9(x - 8)$
 $h(x) = x^2 + 4x + 8$
 $j(x) = x^2 - 8x + 16$
 $k(x) = -2(x + 4)(x + 1)$

Back Reset Go to... Question 7 of 13 Review Next
 PEM QC STUDENT

SAY If you change your mind about an answer, you can click the eraser tool at the top of the screen, then click the answer you want to unselect. Or, you can click the *Reset* button at the bottom of the screen to unselect all of your answer choices at one time.

Encourage students to practice changing their answers by using the eraser tool and the *Reset* button.

Identify each function that has exactly one zero.

$f(x) = 9x^2 - 4$
 $g(x) = 9(x - 8)$
 $h(x) = x^2 + 4x + 8$
 $j(x) = x^2 - 8x + 16$
 $k(x) = -2(x + 4)(x + 1)$

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

[Back](#) [Reset](#) [Go to...](#) Question 7 of 13 [Review](#) [Next](#)
 PEM QC STUDENT

SAY Which answer or answers did you choose?

Pause for replies. There are two answers: $g(x) = 9(x - 8)$ and $j(x) = x^2 - 8x + 16$.

SAY The correct answers are $g(x) = 9(x - 8)$ and $j(x) = x^2 - 8x + 16$. Do you have any questions?

Answer questions about how to click to select an answer or use the tools.

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

Wait for students to click *Next*. Check to see that the students are looking at the correct question.

SAY Read question 8 to yourself. Notice that question 8 is not a traditional multiple-choice item, but is also one that requires you to select one or more answers.

Pause while students read the question.

Identify each function that has an x -intercept of 3.

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

$f(x) = \frac{-4x + 15}{5}$
 $g(x) = 3 - \frac{1}{2}x^2$
 $h(x) = \frac{5}{3}x - 5$
 $j(x) = (x + 3)(x - 5)$
 $k(x) = 3x^2 - 11x + 6$

Back Reset Go to... Question 8 of 13 PEM QC STUDENT Review Next

SAY Remember, there may be one correct answer or multiple correct answers to this item. Be sure to select each function that you want to be considered as correct. To select a function, place the cursor over the white box and then click once.

Determine which answer or answers are correct and click on the answer you have chosen.

Pause while students work to find the answer(s) to the question and click on their response(s).

SAY Which answer or answers did you choose?

Pause for replies. There are two correct answers: $h(x) = \frac{5}{3}x - 5$ and $k(x) = 3x^2 - 11x + 6$

SAY The correct answers are $h(x) = \frac{5}{3}x - 5$ and $k(x) = 3x^2 - 11x + 6$. Do you have any questions?

Answer all questions.

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

Wait for students to click *Next*. Check to see that the students are looking at the correct question.

SAY Read question 9 to yourself. Notice that question 9 is not a multiple-choice item, but is one that requires you plot a solution on the grid.

Pause while students read the question.

The graph of $f(x) = x^2 + 4x - 5$ is shown.

Identify each solution to $f(x) = 0$.

Directions: Click on the grid to plot each solution. You must plot all solutions.

Back Reset Question 9 of 13 Review Next
Go to... PEM QC STUDENT

SAY The directions say, “Click on the grid to plot each solution. You must plot all solutions.”

There may be one point or multiple points to plot in order to get this item correct. You must plot all the correct points, and only those points, on the grid.

To plot a point, place your cursor over the location you wish to select and then click once. A red point will appear where you have clicked.

The graph of $f(x) = x^2 + 4x - 5$ is shown.

Identify each solution to $f(x) = 0$.

Directions: Click on the grid to plot each solution. You must plot all solutions.

Back Reset Go to... Question 9 of 13 Review Next
 PEM QC STUDENT

SAY If you change your mind about the point or points you selected, you may click the **Reset** button on the bottom of the screen to erase all of your points and start over, or click on the eraser tool at the top of the screen to erase one answer at a time.

Determine the solution or solutions and plot your answer.

Pause while students work to find the answer and plot the solution.

SAY Which points did you plot?

Pause for replies. There are two correct answers: $(-5,0)$ and $(1,0)$.

SAY The points should be located at $(-5,0)$ and $(1,0)$. Do you have any questions about how to plot a point on the grid?

Answer all questions.

The graph of $f(x) = x^2 + 4x - 5$ is shown.

Identify each solution to $f(x) = 0$.

Directions: Click on the grid to plot each solution. You must plot all solutions.

Back Reset Go to... Question 9 of 13 Review Next
 PEM QC STUDENT

SAY Sometimes on graphing items, the number of points that you can plot on the grid is limited. For instance, if you had tried to plot more than four points for this item, you would not have been allowed to do so.

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

Wait for students to click *Next*. Check to see that the students are looking at the correct question.

SAY Read question 10 to yourself. Notice that question 10 is not a multiple-choice item. This item will require you to type your answer in the empty box located below the inequality.

Pause while students read the question.

Solve for x :

$$6x - 11 - 13x < 7 - 5x$$

Directions: Type an inequality in the box. Use the $<$ and $>$ for the inequality sign.

Back Reset Go to... Question 10 of 13 PEM QC STUDENT Review Next

SAY The directions say, “Type an inequality in the box. Use the less than ($<$) and greater than ($>$) symbol for the inequality sign.”

The answer you type into the box should also contain the variable x .

Solve the inequality and then place your cursor inside the box and type your answer.

Pause while students work to find the answer and type it in the empty box. It does not matter whether the student places the variable on the left or right side of the inequality.

Solve for x :

$$6x - 11 - 13x < 7 - 5x$$

Directions: Type an inequality in the box.
Use the $<$ and $>$ for the inequality sign.

Back Reset Go to... Question 10 of 13 Review Next
PEM QC STUDENT

SAY What is the correct answer?

Pause for replies.

SAY The correct answers are $x > -9$ or $-9 < x$. It does not matter whether you place the variable on the left side or the right side of the inequality. Both of these answers will be scored as correct. However, for this item, you must include the variable x and the inequality sign for your answer to be considered complete.

Also notice that the answer you entered does not need to be the same length as the box.

Do you have any questions about how to type your answer in the box?

Answer all questions.

Solve for x :

$$6x - 11 - 13x < 7 - 5x$$

Directions: Type an inequality in the box.
Use the $<$ and $>$ for the inequality sign.

Back Reset Go to... Question 10 of 13 Review Next
PEM QC STUDENT

SAY Now try entering other characters into the box, such as letters other than x , or symbols.

Pause while students try to enter other characters.

SAY Notice that the box will only accept numbers, the letter x , a negative sign, and the inequality signs. For any item that requires you to type your answer in a box, if a letter, number or symbol does not appear in the answer box after you've tried to enter it, then you cannot use that symbol in your answer. Make sure you pressed the correct key before deciding the symbol cannot be used.

Pause while students try to enter other characters.

SAY You can use either the backspace key on the keyboard or the *Reset* button at the bottom of the screen to clear your answer. Clear the answer box now and reenter $x > -9$ or $-9 < x$, which are the correct answers to this problem.

Pause while students clear the answer box and retype their answer.

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

Wait for students to click *Next*. Check to see that the students are looking at the correct question.

SAY Read question 11 to yourself. Notice that this item is not a traditional multiple-choice question and that this item has color in it to emphasize that you are looking for the property that justifies the work between Step 4 and Step 5. These directions tell you that there is one answer choice that is correct for this item.

Pause while students read the question.

Identify the property that justifies the work between Step 4 and Step 5.

Directions: Click on a box to choose the property you want to select.

Step 1: $-6 \leq -2x + 3$

Step 2: $-6 + (-3) \leq -2x + 3 + (-3)$

Step 3: $-9 \leq -2x + 0$

Step 4: $-9 \leq -2x$

Step 5: $\left(-\frac{1}{2}\right)(-9) \geq \left(-\frac{1}{2}\right)(-2x)$

Step 6: $\frac{9}{2} \geq 1x$

Step 7: $\frac{9}{2} \geq x$

Distributive Property	Commutative Property of Multiplication
Inverse Property of Multiplication	Identity Property of Multiplication
Multiplication Property of Inequality	Addition Property of Inequality

Buttons: Back, Reset, Go to..., Question 11 of 13, PEM QC STUDENT, Review, Next

SAY Decide which property within the dark gray box is correct. Select your answer by clicking on it. An orange outline will appear around the property you select.

Remember, if you change your mind about the property you selected, you may click the *Reset* button on the bottom of the screen to unselect your answer and start over, or click on the eraser tool at the top of the screen to erase it.

Pause while students work to find the answer.

SAY Which answer did you choose?

Pause for replies.

SAY The correct answer choice is the “Multiplication Property of Inequality.” Do you have any questions?

Answer all questions.

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

Wait for students to click *Next*. Check to see that the students are looking at the correct item.

SAY Read question 12 to yourself, including the directions. Notice that this item is not a multiple-choice question, but will require you to click and drag your answer

choices to the empty box to create a system of inequalities that could be represented by the graph.

Pause while students read the question.

The screenshot shows a math software interface. At the top left is a toolbar with icons for selection, erasing, and drawing. The main area contains the following elements:

- Question Text:** "Using the inequalities shown, create a system of two inequalities that could be represented by this graph."
- Graph:** A coordinate plane with x and y axes ranging from -5 to 5. A solid line passes through (0, 2) and (4, 0). A dashed line passes through (0, -2) and (-2, 0). The region above the solid line and to the right of the dashed line is shaded dark gray.
- Directions:** "Directions: Click and drag the two selected inequalities to the box."
- Empty Box:** A large empty rectangular box for the user to place the selected inequalities.
- Inequality Choices:** A grid of four pairs of inequalities:

$y > -\frac{1}{2}x + 2$	$2x + 5 > y$
$y < -\frac{1}{2}x + 2$	$2x + 5 < y$
$y \geq -\frac{1}{2}x + 2$	$2x + 5 \geq y$
$y \leq -\frac{1}{2}x + 2$	$2x + 5 \leq y$
- Navigation:** Buttons for "Back", "Reset", "Go to...", "Question 12 of 13", "PEM QC STUDENT", "Review", and "Next".

SAY The inequalities that can be used to create the system of inequalities are inside the dark gray box.

If you do not click and drag two inequalities into the empty box, the question will not be answered. If you only drag one inequality into the box, the question will be considered answered on the review screen, even though you did not completely answer the question, and it will be considered incorrect.

Determine which two inequalities you want to select. Then click and drag the inequalities into the empty box to create the system of inequalities.

Pause while students solve the problem.

Using the inequalities shown, create a system of two inequalities that could be represented by this graph.

Directions: Click and drag the two selected inequalities to the box.

$y > -\frac{1}{2}x + 2$	$2x + 5 > y$
$y < -\frac{1}{2}x + 2$	$2x + 5 < y$
$y \geq -\frac{1}{2}x + 2$	$2x + 5 \geq y$
$y \leq -\frac{1}{2}x + 2$	$2x + 5 \leq y$

Question 12 of 13
PEM QC STUDENT

Back Reset Go to... Review Next

SAY Which two answer choices did you choose?

Pause for replies. The correct answers are: $y \geq -\frac{1}{2}x + 2$ and $2x + 5 > y$, and the order of the inequalities inside the box does not matter.

SAY The correct inequalities are $y \geq -\frac{1}{2}x + 2$ and $2x + 5 > y$. It does not matter which order you drag the inequalities into the box.

Using the inequalities shown, create a system of two inequalities that could be represented by this graph.

Directions: Click and drag the two selected inequalities to the box.

$$\begin{cases} y \geq -\frac{1}{2}x + 2 \\ 2x + 5 > y \end{cases}$$

$y > -\frac{1}{2}x + 2$	$2x + 5 < y$
$y < -\frac{1}{2}x + 2$	$2x + 5 \geq y$
$y \leq -\frac{1}{2}x + 2$	$2x + 5 \leq y$

Back Reset Go to... Question 12 of 13 Review Next
 PEM QC STUDENT

SAY Practice changing the order of the two correct inequalities. Either use the *Reset* button to reset the inequalities back into the dark gray box at the same time, or drag them back to the dark gray box individually. Then click and drag the two correct inequalities into the empty box in the other order.

Pause while the students practice changing the order of the two inequalities.

SAY Do you have any questions about how to click and drag an answer choice or how to change your answer?

Pause to answer all questions.

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

Wait for students to click *Next*. Check to see that the students are looking at the correct question.

SAY Read question 13 to yourself, including the directions. Notice that question 13 is not a multiple-choice item. This item will require you to type your answer in the empty box located below the question.

Pause while students read the question and directions.

A data set has a mean of 68.42 and a standard deviation of 7.91. An element in this set is 57.

What is the z-score for 57 ? Round the answer to the nearest hundredth.

z-score =

Directions: Type your answer in the box. Your answer must be in decimal form, rounded to the nearest hundredth. Use "." for the decimal point.

Given:
 x represents an element of the data set,
 x_i represents the i^{th} element of the data set,
 n represents the number of elements in the data set,
 μ represents the mean of the data set, and
 σ represents the standard deviation of the data set.

$$\text{z-score } (z) = \frac{x - \mu}{\sigma}$$

Back Reset Go to... Question 13 of 13 Review Next
 PEM QC STUDENT

SAY The directions say, “Type your answer in the box. Your answer must be in decimal form, rounded to the nearest hundredth. Use the period (“.”) for the decimal point.”

These directions specifically tell you that your answer must be in decimal form and rounded to the nearest hundredth. It is important to enter your answer according to the directions so that your answer is scored correctly.

Also notice the formula box below the directions that has a formula that may help you solve this problem. Since this formula is provided in a formula box, it is not on the formula sheet provided in the Exhibit window. However, as you did in

question 5, click on the Exhibit tool () on the toolbar to see the formula sheet. The formula sheet is presented differently and I want you to practice manipulating the formula sheet on the screen.

Pause for students to click on the Exhibit tool icon.

The Exhibit tool for a Technology Enhanced Item (TEI) is slightly different than the Exhibit tool for a traditional multiple choice item.

A data set has a mean of 68.42 and a standard deviation of 7.91. An element in this set is 57.

What is the z-score for 57? Round the answer to the nearest hundredth.

z-score =

Directions: Type your answer in the box. Your answer must be in decimal form, rounded to the nearest hundredth. Use "." for the decimal point.

Given:
 x represents an element of the data set,
 x_i represents the i^{th} element of the data set,
 n represents the number of elements in the data set,
 μ represents the mean of the data set, and
 σ represents the standard deviation of the data set.

$$\text{z-score } (z) = \frac{x - \mu}{\sigma}$$

Question 13 of 13
 PEM QC STUDENT

Back Reset Go to... Review Next

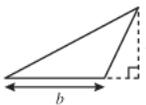
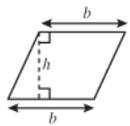
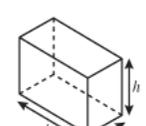
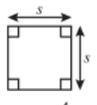
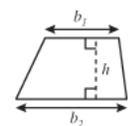
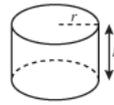
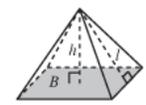
SAY After clicking on the formula sheet icon on the toolbar, you will notice the formula sheet now covers the question.

Exhibit Window

Formula Sheet

Algebra I Formula Sheet

Geometric Formulas

 $A = \frac{1}{2}bh$	 $A = bh$	 $V = lwh$ $S.A. = 2(lw + lh + wh)$	 $V = \frac{1}{3}\pi r^2h$ $S.A. = \pi r(l + r)$
 $p = 4s$ $A = s^2$	 $A = \frac{1}{2}h(b_1 + b_2)$	 $V = \pi r^2h$ $S.A. = 2\pi r(h + r)$	 $V = \frac{1}{3}Bh$ $S.A. = \frac{1}{2}lp + B$
			

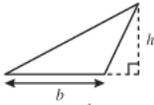
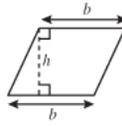
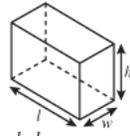
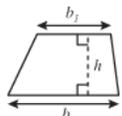
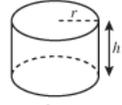
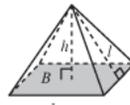
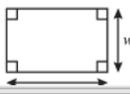
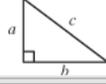
Question 13 of 13
 PEM QC STUDENT

Back Reset Go to... Review Next

SAY The formula sheet can be re-sized and moved on your screen so you can view both the question and the formula sheet. To do this, place your cursor near the lower right corner of the Exhibit window until your cursor changes to a double ended arrow.

Algebra I Formula Sheet

Geometric Formulas

 $A = \frac{1}{2}bh$	 $A = bh$	 $V = lwh$ $S.A. = 2(lw + lh + wh)$	 $V = \frac{1}{3}\pi r^2h$ $S.A. = \pi r(l + r)$
 $p = 4s$ $A = s^2$	 $A = \frac{1}{2}h(b_1 + b_2)$	 $V = \pi r^2h$ $S.A. = 2\pi r(h + r)$	 $V = \frac{1}{3}Bh$ $S.A. = \frac{1}{2}lp + B$
			

Question 13 of 13
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SAY Drag your cursor towards the center of the exhibit window until the formula sheet is the desired size.

The screenshot shows a software interface titled "Exhibit Window" with a red close button in the top right corner. Inside the window, there is a "Formula Sheet" tab. The sheet is titled "Algebra I Formula Sheet" and "Geometric Formulas". It contains several diagrams and formulas:

- A triangle with base b and height h , with the formula $A = \frac{1}{2}bh$.
- A parallelogram with base b and height h , with the formula $A = bh$.
- A square with side length s , with the formula $p = 4s$.
- A trapezoid with top base b_1 and height h .
- A rectangular prism with length l , width w , and height h , with formulas $V = lwh$ and $S.A. = 2(lw + lh)$.
- A cylinder with radius r .

 To the right of the formula sheet is a question interface. It includes a "Directions" box: "Directions: Type your answer in the box. Your answer must be in decimal form, rounded to the nearest hundredth. Use "." for the decimal point." Below this is a text input area with a red arrow pointing to it. At the bottom of the window, there are navigation buttons: "Back", "Reset", "Go to...", "Question 13 of 13", "Review", and "Next". The text "PEM QC STUDENT" is also visible at the bottom.

SAY Now you can move the formula sheet by placing your cursor on the gray Exhibit window task bar. Your cursor will change to a hand. Drag the formula sheet to the desired location on the screen. Notice the two scrollbars on the right and the bottom of the formula sheet that can be used to scroll the formula sheet up and down or to the left and right.

Pause while students practice using this tool.

The screenshot shows a math assessment interface. At the top, there is a toolbar with icons for navigation and help. The main question area contains the following text:

A data set has a mean of 68.42 and a standard deviation of 7.91. An element in this set is 57.

What is the z-score for 57? Round the answer to the nearest hundredth.

Below the question is a text input field labeled "z-score =".

To the right of the question is a box with the following directions:

Directions: Type your answer in the box. Your answer must be in decimal form, rounded to the nearest hundredth. Use "." for the decimal point.

An "Exhibit Window" is open, titled "Algebra I Formula Sheet". It contains the following content:

Formula Sheet

Algebra I Formula Sheet

Geometric Formulas

Area of a Triangle: $A = \frac{1}{2}bh$

Area of a Parallelogram: $A = bh$

Volume of a Rectangular Prism: $V = lwh$

Surface Area of a Rectangular Prism: $S.A. = 2(lw + lh + wh)$

The formula sheet also includes a z-score formula: $z = \frac{X - \mu}{\sigma}$

At the bottom of the interface, there are navigation buttons: "Back", "Reset", "Go to...", "Question 13 of 13", "Review", and "Next".

SAY Since you do not need the formula sheet, but will instead use the formula box, click the X in the upper right corner of the Exhibit window to put the tool away.

Wait for students to put the tool away.

SAY Use your scratch paper, calculator, and the formula box to find the answer to this question. Then place your cursor inside the box and type your answer.

Pause for students to work and enter their answers.

SAY What is the correct answer?

Pause for students to reply.

SAY The correct answer is -1.44. Do you have any questions?

Pause to answer all questions.

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

Wait for students to click *Next* and check to be sure all students are looking at the *Review* screen.

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

Once the practice items are reviewed and completed, click the *Submit* button. Then click "Yes, submit my test." Then you will see the question, "Do you wish to end the test and submit your answers?" Click "Yes." This will exit the practice items.

You may now practice navigating between the *Review* screen and the practice items. Then exit the practice items to end this practice session.

Wait for students to practice navigating from the *Review* screen to practice items, and then for them to submit their test.

Note that each student’s review screen may vary, depending upon whether a question was left unanswered or marked for review.

To go to a specific question, click on the question name.

Section
↓

Question Name	Answered?	Review?
Question 1		
Question 2		
Question 3		✓ Review
Question 4		
Question 5		
Question 6		
Question 7		
Question 8		
Question 9		
Question 10	Not Answered	✓ Review
Question 11		
Question 12		
Question 13		

To end the test and submit your answers for final scoring, click on the Submit button.

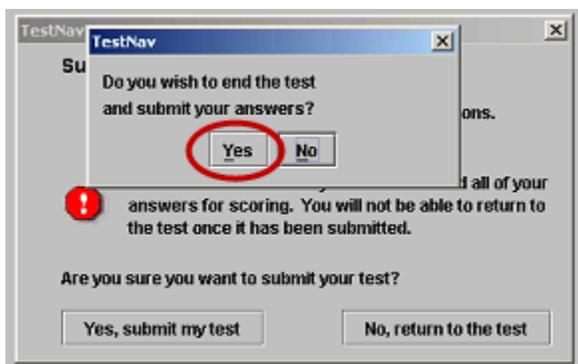
TestNav

Submit Test for Scoring

Section 1: 0 unanswered questions.

 You are about to submit your test and send all of your answers for scoring. You will not be able to return to the test once it has been submitted.

Are you sure you want to submit your test?



To start the practice items again, return to the “START THE ePAT LAUNCHER” section on page 9 for directions if needed.