

# Standards of Learning Guided Practice Suggestions

**For use with the 2016 Mathematics SOL and**

**2023 Mathematics SOL (Field-test items)**

**Practice Items in TestNavTM 8**

**March 2024**

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## Introduction to TestNav 8: MULTIPLE-CHOICE/TEI Document

The [*Introduction to TestNav 8*: *Multiple-Choice/Technology Enhanced Item Tests*](https://www.doe.virginia.gov/home/showpublisheddocument/20825/638255443523500000)documentserves as an introduction to the online navigation, tools, accessibility features, and overall functionality and appearance of TestNav 8. It is highly recommended that teachers (or other adults) read the *Introduction to TestNav 8: MC/TEI*document prior to reading this guide, the *Guided Practice Suggestions* for the Mathematics practice item sets.

Reading the *Introduction to TestNav 8: MC/TEI*document will give teachers an understanding of the features of TestNav 8 prior to working with students**.** In part, the document provides information on:

* opening the practice item sets within the required TestNav 8 Application,
* navigating through the practice item sets,
* answering technology-enhanced items (TEI) and multiple-choice items,
* using the online tools, and
* using the accessibility features available in TestNav 8.

Use the [*Introduction to TestNav 8*: *Multiple-Choice/Technology Enhanced Item Tests*](https://www.doe.virginia.gov/home/showpublisheddocument/20825/638255443523500000) document in conjunction with the information found in this guide.

## Guided Practice Suggestions

This guide provides specific information for each question in the mathematics practice items. Along with the item information, there are guided practice suggestions in the Functionality Description column of the table. This column contains information for teachers as they guide students through the practice items. For instance, guided practice suggestions can state, “Make sure students know how to select draggers and place them in the empty boxes using the mouse, keypad, or touchscreen.” Following the suggestions in the table will ensure that students are exposed to all of the different tools within TestNav 8, the different functionality features of TEI, and the common messages that may appear as students complete TEI.

## Online Tools, Features, Icons, and Descriptions of Function

## Tools Located on the Tool Bar

* Pointer 

Use to select an answer on screen as well as to place the cursor in an answer box, plot points, select one or more answers, and drag information from one location to another.

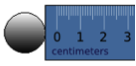
* Answer Eliminator Icon

Use to eliminate (cross off) answer options. This tool functions with multiple-choice questions and certain TEIs.

These tools may not be used in conjunction with another tool. The end points of the tool allow the tool to be rotated.

* + Inch Ruler Icon

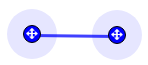
Use to measure an object on the screen.

* + Centimeter Ruler 

Use to measure an object on the screen.

* + Protractor Icon

Use to measure an angle.

* + Straightedge 

Use to create a straight line. To stretch or shrink the line, click and drag one of the end points.

* + Desmos Calculator Icon

Use for mathematical calculations and graphical representations.

* Grades 4 and 5 - Desmos Virginia Four-Function calculator for calculator active items
* Grades 6-8 - Desmos Virginia Scientific calculator for calculator active items
* End-of-Course (EOC) mathematics - Desmos Virginia Graphing calculator
* *For additional information on* [*Desmos*](https://www.desmos.com)*, please refer to the* [*Desmos Online Calculator webpage*](https://vdoe.prod.govaccess.org/teaching-learning-assessment/instruction/mathematics/standards-of-learning-for-mathematics/desmos-online-calculator) *on the VDOE website and the* [*Desmos*](https://www.desmos.com) *website.*

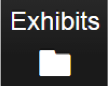
**Tools Not Located on the Tool Bar**

* Highlighter Icon

Use to highlight text.

To access the highlighter, select the text and the highlighter options will appear. Choose a color and the selected text will be highlighted. To remove the highlight, select the highlighted text and choose the red slash. The colors will vary depending on the background chosen. Default colors are pink and blue.

Students cannot highlight art, pictures, images, or text when presented as art. There is no limit to the number of highlights a student can make within the test.

* Exhibit Window 

Use to view exhibits such as Formula Sheets and z-tables.

Located on the right-hand side of the screen

* Drawing Interaction Tool 

Used to interact with an item. This tool is a boxed area around part of an item that exists on certain mathematics and science questions. The tools are located to the right of the drawing interaction area. The individual tools are:

* Pencil or straight line Icon

Use to make marks, notations, straight lines, or dots on or around artwork or graphs inside the drawing interaction area.

The arrow in the bottom right corner expands the tool to allow for free draw or a straight line. A dot may be placed using the mouse, keypad, or touch screen. Select free draw and use the mouse or keypad to click and release to place a point. If using a touch screen, use a finger to place a point.

* Compass Icon

Use to create a construction.

The solid black dot, which is the compass point, is used to move the compass to a desired location. Use the middle gray circle to lengthen or shorten the drawing radius. The dashed circle indicates the length of the drawing radius. The length of the drawing radius will not change unless the middle gray circle is selected. The small open circle on the arrow is the compass pencil. This will be used to draw the arcs. To move the compass after beginning a construction, use the compass point, not the middle gray circle.

* Eraser Icon

Use to erase selected lines, markings, or writing.

* Color Selector Icon

Use to make markings black or green. The arrow in the bottom right corner expands the tool to allow a color selection.

* Mark Thickness Icon

Use to select the thickness of the markings. The arrow in the bottom right corner expands the tool to allow a size selection.

* Undo or Redo Icon

Use to remove the most recent markings.

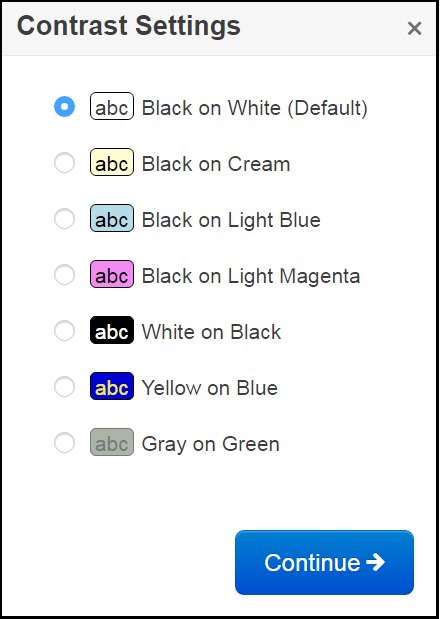
* Clear All Icon

Use to eliminate all markings at the same time

* User Dropdown Menu Icon

#### **Change the Background and Foreground Colors**

Use to select background and colors. The list of background and foreground colors is shown in the screen shot below.



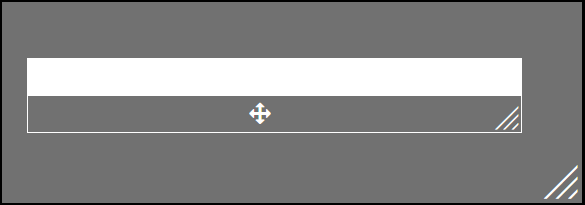
*Note: Black on White is the Default setting.*

### Enable Magnifier

Use to magnify an area. When selected, a square box appears on the screen that can be moved anywhere to magnify the text/art within the box. This tool needs to be selected for each test item as needed. To remove the tool from the screen, select *Disable Magnifier* in the user dropdown menu. The way it will appear on the screen is shown below.

### **Show Line Reader Mask**

Use to “mask” part of an item. When selected, a mask will appear on the screen that may be placed over text or test items. The line reader mask has a window, which shows only one line of text. The mask and the window can be resized by clicking and dragging on the three lines located in the bottom right-hand corner of the inner and outer boxes of the tool. This tool needs to be selected for each test item as needed. To remove the tool from the screen, select *Hide Line Reader Mask* in the user dropdown menu. A screenshot of the line reader mask is shown.



### **Enable Answer Masking**

Use to mask answer options. By selecting this tool, a mask will appear over all multiple- choice answer options. (this feature is not available on TEI questions). To uncover an answer choice, select the gray box with the image of an eye. Once this tool is enabled, the answer masks will be present on all multiple-choice questions. To remove the tool from the screen, select *Disable Answer Masking* in the user dropdown menu. A screenshot of answer masking enabled is shown.



### Zoom-In and Zoom-Out Feature

Use to enlarge or shrink text or images on the screen. Selecting “+” increases the zoom. Selecting “–” decreases the zoom. Other methods can activate Zoom depending on the device (keyboard shortcuts, pinch to zoom, etc.). Once zoom is set, this setting applies to all test items until it is changed.

#### **Sign out of TestNav**

Use to exit the test. Selecting this will bring up the Exit Test screen. The Exit Test screen permits the student to Exit the Test, or to Cancel the selection and return to the test.

**Tool to Answer an Item**

TestNav tools cannot be used to indicate answers to online test items. The Pointer Icon must be used to:

1. select multiple-choice answers;
2. place the cursor in a box in order to type an answer;
3. plot points on a line, graph, or graphic;
4. select one or more answers; or
5. drag answers from one location to another.

If the student uses a tool other than the Pointer to indicate an answer, the Review dropdown will show that question as *Not Answered*. If a student feels the question was answered, instruct the student to go back to the test item to make sure the Pointer was used to indicate the answer.

A Help menu for the TestNav tools is not available.

**Additional Tools**

## Audio Tools

Students who are assigned an “audio” test for the 2016 *Mathematics Standards of Learning* will see the audio tools for the text-to-speech reader on the right side of the screen.

The  Play button reads the item from the beginning. Each word within the text is highlighted in blue as it is read. While the audio is playing, the arrow becomes a square Stop button. Selecting it stops the reader.
The Toggle Click-to-Hear Tool allows students to select where, within the item, the audio will begin.
The Settings Wheel allows students to adjust the audio settings. Selecting the Settings Wheel will generate the Audio Settings tool.


Students may change the speed of the audio by selecting the minus to slow it down or the plus to speed it up.
The voice has a default gender and may not be changed.
Students many change the volume of the audio by dragging the volume slider right or left to increase or decrease the volume.


## Grade 3 Mathematics

### Section 1

| Question Number | Item Type | Correct Answer | Functionality Description |
| --- | --- | --- | --- |
| 1 | TEI Drag and Drop | From top to bottom: Ten thousands; Hundreds | Selecting a dragger and moving it to an empty box causes the remaining draggers to shift location in the answer option area.  Have students try to place one dragger “over” another dragger. This cannot be done. If a student wishes to change an answer, the dragger must be moved back to the gray box. This question will be considered “Answered” when each box has an answer in it. |
| 2 | TEI Fill in the Blank | 705,003 or 705003 | Have students attempt to enter a character that cannot be used as part of the answer. A message will appear that states, “*You cannot use that character.*”  This message will remain on the screen for approximately three seconds.  Tell students that the answer does not need to be as long as the response box, and a blank space can never be entered into a response box.  Tell students that answers with four or more digits will be scored as correct with or without the use of commas. If a comma is used, it must be in the correct location within the number. This question will be considered “Answered” once a number or symbol has been placed in the box. |
| 3 | Multiple Choice | A: 3,000 | None |
| 4 | Multiple Choice | B: 8,285 | None |
| 5 | TEI Fraction Model | The figure should be divided into 8 parts and any 7 parts should be shaded. | Follow the directions to complete this model. |
| 6 | TEI Hot Spot | Any 22 boxes should be shaded. | This question has a drawing interaction box. Have students select and practice the various tools.  Tell students that when there are an unspecified number of answers, the question will be considered “Answered” when one answer (or part) has been selected (or shaded). This is so no clue or hint is given as to how many answers are correct (or should be shaded). |
| 7 | TEI Hot Spot | The first and third models should be selected. | To answer this question correctly, all correct answers in the gray box must be selected. A bold blue box outlines the answer choice when it is selected, indicating a student has chosen that response as an answer. In order to deselect an answer and remove the blue box, the answer choice must be selected again.  This item specifies the number of answers a student must select. If a student tries to select more than the number of answers indicated, a message stating, “*You must remove an answer before you can choose a new one.*” appears in the top right corner of the screen. This message will remain for approximately three seconds unless the “x” is selected to close the message. Have students try to select an additional answer so that they can see this message appear. |
| 8 | TEI Drag and Drop | Five of the models should be placed in the box. | This question will be considered “Answered” once one model has been placed in the box. |
| 9 | Multiple Choice | B: Set B | None |
| 10 | TEI Equation Editor | or an equivalent equation that uses these numbers | In order to answer this item, students must type a response in the box.  This question will be considered “Answered” once a number or symbol has been placed in the box.  Encourage students to try removing their response and then entering a different expression so they can practice using different operation symbols. Note for teachers: Either the minus or the negative symbol may be used on the palette, and both would score correct. Students in grades 3-5 will NOT have the negative symbol enabled on the equation palette in any test item that will be field-tested in spring 2024. |
| 11 | Multiple Choice | B: | This question has an Interactive Model. Select the button to play. |
| 12 | Multiple Choice | D: | None |
| 13 | TEI Drag and Drop | From left to right:  *X* ; 9 | Have students try to place an operation symbol into the box on the right. They will not be able to do this. The operation symbols can only be used in the box on the left. Sometimes a restriction is placed on where a dragger can be placed to limit errors.  Have students select the number 9. As they move this number, only the box on the right shades blue, indicating this is the only box that will accept this dragger.  This question will be considered “Answered” when each box has an answer. |
| 14 | Multiple Choice | B: | None |
| 15 | TEI Drag and Drop | From top to bottom: 7, 8 (which creates the fraction ) | As soon as a number is selected and moved, both boxes of the fraction shade blue. This indicates that the number can be placed in either box- whichever location the student chooses as the correct location.  In order for this question to be considered “Answered” both boxes must contain a number. |
| 16 | Multiple Choice | C: miles | None |
| 17 | TEI In Line Choice | From top to bottom: dimes, quarter | To see the choices select the down arrow next to  “Choose. . .” |
| 18 | TEI Drag and Drop | The units of money in the response box must be equal to $1.12.  Examples of correct responses include:  One dollar bill, a dime, and two pennies  OR  Four quarters, two nickels, and two pennies | Let students know that there are several combinations of units of money that may be used to equal $1.12 and any of these combinations would be scored as correct.  Also point out that all units of money except the $5 bill may be used more than once, but there is a limit to the number of times a dragger may be used.  This item will be considered “Answered” once one unit of money has been placed in the response box. |
| 19 | Multiple Choice | A: 2inches | There are two ruler tools on the top of the screen.  Have students select the appropriate ruler for this question, the inch ruler. |
| 20 | Multiple Choice | B: 12 feet | None |
| 21 | Multiple Choice | B: 18 centimeters | Make sure students select the ruler on the right for this item (the centimeter ruler). |
| 22 | Multiple Choice | C: 4 square feet | None |
| 23 | Multiple Choice | D: 8:20 | None |
| 24 | Multiple Choice | A: 3 hours | None |
| 25 | Multiple Choice | D: 5:20 P.M. | None |
| 26 | TEI Bar Graph | The bar should be raised to 53°F, halfway between the first and second interval lines above the line representing 50°F. | In order to answer this item, students must select a location on the white part of the thermometer or drag the arrow to the correct location. If a student wants to change the height, they may select another location and the bar height will change. |
| 27 | Multiple Choice | D: Triangle, quadrilateral, triangle | None |
| 28 | Multiple Choice | C: The circles | None |
| 29 | Multiple Choice | C: Unlikely, but not impossible | None |
| 30 | TEI Drag and Drop | From right to left:   * Olivia * Max * Jacob * Tori | None |
| 31 | TEI Bar Graph | * Nancy = 5; the bar should reach halfway between intervals 4 and 6. * Bryan = 3; the bar should reach halfway between intervals 2 and 4. * Kristen = 8; the bar should reach interval labeled 8. * Ricardo = 9; the bar should reach halfway between intervals 8 and 10. | In order to answer this item, students must select a bar and drag it to the correct height. If a student wants to change the height, they may select the bar and drag it to a different height.  Once one bar has been moved, the item will appear as “Answered” even if all of the bars are returned to the original heights. |
| 32 | Multiple Choice | C: Set C (O, Y, R) | None |
| 33 | Multiple Choice | C: | None |

## Grade 4 Mathematics

### Section 1

| Question Number | Item Type | Correct Answer | Functionality Description |
| --- | --- | --- | --- |
| 1 | Multiple Choice | D: Model 3 and Model 4 | This question has a drawing interaction box. Have students select and practice the various tools.  Notice the “no calculator” symbol in the top right corner of the screen. This symbol will appear when the calculator is not active on the test item.  If the Desmos Virginia calculator appears on the toolbar, it is an allowable tool for the test item. If the Desmos Virginia calculator does not appear on the toolbar, it is not an allowable tool for the test item. |
| 2 | TEI Drag and Drop | From top to bottom:   * Tenths * Thousands * Tens * Ones * Hundreds * Hundredths | Selecting a dragger and moving it to an empty box causes the remaining draggers to shift location in the answer option area.  As soon as a dragger is selected and moved, all of the boxes shade blue. This indicates that the dragger can be placed in any box - whichever location the student chooses as the correct location.  This item will be considered “Answered” when each box has an answer. |
| 3 | Multiple Choice | D: and 0.2 | None |
| 4 | Multiple Choice | D: 72 | None |
| 5 | TEI Hot Spot | Both and should be selected. | To answer this question correctly, all correct answers in the gray box must be selected. A bold blue box outlines the answer choice when it is selected, indicating a student has chosen that response as an answer. In order to deselect an answer and remove the blue box, the answer choice must be selected again.  This item specifies the number of answers a student must select. If a student tries to select more than the number of answers indicated, a message stating, “*You must remove an answer before you can choose a new one.*” appears in the top right corner of the screen. This message will remain for approximately three seconds unless the “x” is selected to close the message. Have students try to select an additional answer so that they can see this message appear. |
| 6 | TEI Fill in the Blank | 49R5 or 49r5 | Tell students that the answer does not need to be as long as the response box. Make sure students understand that a blank space is never an allowable character, so a blank space cannot be entered between the characters in the dividend (i.e., 49 R 5 cannot be entered). |
| 7 | Multiple Choice | D: 108 | None |
| 8 | TEI Fill in the Blank | 8.72 | Have students attempt to enter a character that cannot be used as part of the answer. A message will appear that states, “*You cannot use that character.*”  This message will remain on the screen for approximately three seconds. |
| 9 | Multiple Choice | B: Two divided by 5 equals | None |
| 10 | TEI Fill in the Blank | 16 | None |
| 11 | Multiple Choice | D: 3,456 | None |
| 12 | Multiple Choice | B: 300 miles | None |
| 13 | Multiple Choice | D: 83 | None |
| 14 | TEI Fraction Model | The figure should be divided into 10 total parts and any 3 parts should be shaded. | Follow the directions to complete this model. |
| 15 | Multiple Choice | A: $2.94 | None |
| 16 | TEI Drag and Drop | From top to bottom:   * 8.13 * 8.149 * 8.698 * 8.7 | This question will be considered “Answered” when each box has an answer. |
| 17 | TEI Hot Spot | All of these should be selected:   * 1 * 2 * 4 * 8 | Tell students when there are an unspecified number of answers, the question will be considered “Answered” when one answer has been selected. This is so no clue or hint is given as to how many answers are correct. |
| 18 | TEI Hot Spot | All of these answers must be selected:  Pencil: Mass between 0 and 100 grams  Chair: Mass between 1 and 10 kilograms  Child’s glasses: Mass between 0 and 100 grams | A check box will indicate that an answer has been selected. This item will show as “Answered” once any three boxes have been selected. If a student tries to select more than three answers, a message stating, “*You must remove an answer before you can choose a new one.*” appears in the top right corner of the screen. This message will remain for approximately three seconds unless the “x” is selected to close the message. |
| 19 | Multiple Choice | A: 32 | None |
| 20 | TEI Hot Spot | Both 4 yards and 144 inches should be selected. | None |
| 21 | Multiple Choice | C: 3 hours 55 minutes | None |
| 22 | Multiple Choice | B: 2:20 P.M. | None |
| 23 | Multiple Choice | C: Square | None |
| 24 | Multiple Choice | D: Figure D | None |
| 25 | TEI Hot Spot | All of these answers and only these answers should be selected:   * There are exactly four sides. * All sides must be congruent. * Both pairs of opposite sides must be parallel. | None |
| 26 | TEI In Line Choice | From top to bottom: blue; yellow or red | To see the choices select the down arrow next to “Choose. . .” |
| 27 | Multiple Choice | A: W | None |
| 28 | Multiple Choice | A: Spinner A | None |
| 29 | TEI Bar Graph | * M – The bar should reach the interval labeled 6. * N – The bar should reach halfway between intervals 10 and 12. * P – The bar should reach halfway between intervals 6 and 8. * Q – The bar should reach the interval labeled 4. * R – The bar should reach halfway between intervals 12 and 14. | In order to answer this item, students must select a bar and drag it to the correct height. If a student wants to change the height, they may select the bar and drag it to a different height.  Once one bar has been moved, the item will appear as “Answered” even if all of the bars are returned to the original heights. |
| 30 | Multiple Choice | C: Year 4 and Year 5 | None |
| 31 | Multiple Choice | B: 68 | None |
| 32 | TEI Equation Editor | Any value or expression equal to 80 | In order to answer this item, students must type a response in the box. Actual test items may specify what operation or how many terms should be used in the equivalent expression.  This question will be considered “Answered” once a number or symbol has been placed in the box.  Encourage students to try removing their response and then entering a different expression so they can practice using different operation symbols. |

## Grade 5 Mathematics

### Section 1

| Question Number | Item Type | Correct Answer | Functionality Description |
| --- | --- | --- | --- |
| 1 | TEI Drag and Drop | From top to bottom:  0.2  0.5  0.4 | Notice the “no calculator” symbol in the top right corner of the screen. This symbol will appear when the calculator is not active on the test item.  If the Desmos Virginia calculator appears on the toolbar, it is an allowable tool for the test item. If the Desmos Virginia calculator does not appear on the toolbar, it is not an allowable tool for the test item.  Selecting a dragger and moving it to an empty box causes the remaining draggers to shift location in the answer option area.  Have students try to place one dragger “over” another dragger. This cannot be done. If a student wishes to change an answer, the dragger must be moved back to the gray box and another option must be selected and moved into the response box.  This item will not be considered “Answered” until each box has an answer in it. |
| 2 | TEI Hot Spot | All three of these numbers, and only these three numbers, must be selected.  7.534  7.530  7.529 | To answer this question correctly, all correct answers in the gray box must be selected. A blue box outlines the answer choice when it is selected, indicating a student has chosen that response as an answer. In order to deselect an answer and remove the blue box, the answer choice must be selected again.  When there are an unspecified number of answers, the question will be considered “Answered” when one answer has been selected. This is so no clue or hint is given as to how many answers are correct. |
| 3 | TEI Drag and Drop | From top to bottom:   * 4.595 * 4.49 | As soon as a dragger is selected and moved, all of the boxes shade blue. This indicates that the dragger can be placed in any box - whichever location the student chooses as the correct location.  This item be considered “Answered” when each box has an answer. |
| 4 | Multiple Choice | B: 0.603 | None |
| 5 | TEI Hot Spot | All four of these numbers and only these numbers must be selected.   * 29 * 2 * 5 * 17 | This item specifies the number of answers a student must select. If a student tries to select more than the number of answers indicated, a message stating, “*You must remove an answer before you can choose a new one.*” appears in the top right corner of the screen. This message will remain for approximately three seconds unless the “x” is selected to close the message. Have students try to select an additional answer so that they can see this message appear. |
| 6 | Multiple Choice | A: 3 + 6 | None |
| 7 | TEI Hot Spot | These three answers, and only these answers, must be selected:   * The sum of two even numbers is even. * The difference between an odd number and an even number is odd. * The difference between two odd numbers is even. | None |
| 8 | Multiple Choice | D: 88 | None |
| 9 | Multiple Choice | D: 4,602 | None |
| 10 | Multiple Choice | C: 2.551 kilograms | None |
| 11 | Multiple Choice | A: $4.73 | None |
| 12 | TEI Fraction Model | The figure should be divided into 10 parts and any 7 parts can be shaded. | Follow the directions to complete this model. |
| 13 | TEI Fill in the Blank | Answer: ¼ | Make sure students know to enter the forward slash “/” for the fraction bar. Have students attempt to enter a character that cannot be used as part of the answer. A message will appear that states, “*You cannot use that character.*”  This message will remain on the screen for approximately three seconds. |
| 14 | TEI Equation Editor | or | In order to answer this item, students must type a response in the box.  Note for teachers: Students will need to use the structure box to enter a fraction or a mixed number. Have students try to enter a decimal value. The decimal is not an allowable character and will not appear on the screen, nor will an error message appear on-screen if the student attempts to enter a decimal using the keyboard.  This question will be considered “Answered” once a number or symbol has been placed in the box.  Encourage students to try removing their response and then entering a different expression. |
| 15 | Multiple Choice | A: 600 cubic meters | None |
| 16 | Multiple Choice | C: Volume | None |
| 17 | Multiple Choice | D: Area of 21 square units and perimeter of 24 units | None |
| 18 | TEI Fill in the Blank | 1,200 or 1200 milliliters | Tell students that the answer does not need to be as long as the response box and a blank space can never be entered into a response box. Let students know that answers with four or more digits will be scored as correct with or without the use of commas. If a comma is used, it must be in the correct location within the number. |
| 19 | Multiple Choice | B: Wayne’s line segment shows a radius, and Dani’s line segment shows a diameter. | None |
| 20 | Multiple Choice | D: 6:55 | None |
| 21 | Multiple Choice | B: Angle 2 | Students may want to practice using the protractor tool on this item. |
| 22 | TEI Fill in the Blank | 145 degrees; Answers ranging from 142 to 148 are considered correct. | The protractor tool should be used to determine the answer. Have students select the protractor tool. To move the protractor, select any place within the boundaries of the blue protractor and drag it to another location. To rotate the protractor, select and drag an end with the circle. Have students practice moving and rotating the protractor. To put the protractor tool away, select the protractor tool icon again; or select the pointer tool. |
| 23 | Multiple Choice | C: Figure C | None |
| 24 | Multiple Choice | D: Square, triangle, and rhombus | None |
| 25 | Multiple Choice | C: 4/8 | None |
| 26 | TEI Drag and Drop | A correct line plot will include all of the following: Directly above 0: two X’s; Directly above 1: four X’s; Directly above 2: one X; Directly above 3: zero X’s (blank dragger); Directly above 4: two X’s; Directly above 5: one X | The value for “3” on this line plot is zero. Students must place the empty dragger into the response box above the 3. If students do not place a dragger into the line plot above “3” (as shown by the empty shaded box), the question will not be considered “Answered.”  Note: All response boxes must be filled for this question to be considered “Answered.” |
| 27 | Multiple Choice | C: 5 | None |
| 28 | Multiple Choice | B: fair share | None |
| 29 | Multiple Choice | A: 21, 24, 29, 25, 27 | None |
| 30 | TEI Drag and Drop | The mean is 35, the median is 32, the mode is 30, and the range is 31. | None |
| 31 | TEI In Line Choice | From top to bottom: 7; 5 | To see the choices select the down arrow next to “Choose. . .” |
| 32 | Multiple Choice | B: 4, 16, 64, 256 | None |
| 33 | TEI Equation Editor | or an equivalent equation that uses these numbers | Students must type a response in the box. Actual test items may specify what operation or how many terms should be used in the equivalent expression.  This question will be considered “Answered” once a number or symbol has been placed in the box.  Encourage students to try removing their response and then entering a different equation so they can practice using different operation symbols. |

## Grade 6 Mathematics

### Section 1

| Question Number | | Item Type | Correct Answer | Functionality Description |
| --- | --- | --- | --- | --- |
| 1 | | TEI Hot Spot | The model should have any 6 parts shaded. | Notice the “no calculator” symbol in the top right corner of the screen. This symbol will appear when the calculator is not active on the test item.  If the Desmos Virginia calculator appears on the toolbar, it is an allowable tool for the test item. If the Desmos Virginia calculator does not appear on the toolbar, it is not an allowable tool for the test item.  Tell students that when there are an unspecified number of answers, the question will be considered “Answered” when one answer (or part) has been selected (or shaded). This is so no clue or hint is given as to how many answers are correct (or should be shaded). |
| 2 | | Multiple Choice | A: | None |
| 3 | | TEI Hot Spot | All of these numbers and only these numbers should be selected: 0.60 and 60%. | To answer this question correctly, all correct answers in the gray box must be selected. A bold blue box outlines the answer choice when it is selected, indicating a student has chosen that response as an answer. In order to deselect an answer and remove the blue box, the answer choice must be selected again. |
| 4 | | TEI Fraction Model | The figure should be divided into 5 parts with 1 of those parts shaded OR the model should be divided into 10 parts with any 2 of those parts shaded. | Follow the directions to complete this model. |
| 5 | | TEI Equation Editor | or an equivalent expression | Students must type a response in the box. Students can type in numbers, operations, and/or exponents to represent an equivalent expression.  Note for teachers: Students will need to use the structure box to enter an exponent. This question will be considered “Answered” once a number or symbol has been placed in the box.  Encourage students to try removing their response and then entering a different expression so they can practice using different operation symbols. |
| 6 | | TEI Drag and Drop | From top to bottom: 7/10; 10%; 0.09 | Selecting a dragger and moving it to an empty box causes the remaining draggers to shift location in the answer option area.  Have students try to place one dragger “over” another dragger. This cannot be done. If a student wishes to change an answer, the dragger must be moved back to the gray box and another option must be selected and moved into the response box.  This item will be considered “Answered” when each box has an answer. |
| 7 | | Multiple Choice | B: | This question has a drawing interaction box. Have students select and practice the various tools. |
| 8 | | TEI Hot Spot | All of these answers and only these answers should be selected: | This item specifies the number of answers a student must select. If a student tries to select more than the number of answers indicated, a message stating, “*You must remove an answer before you can choose a new one.*” appears in the top right corner of the screen. This message will remain for approximately three seconds unless the “x” is selected to close the message. Have students try to select an additional answer so that they can see this message appear. |
| 9 | | Multiple Choice | B: | None |
| 10 | | Multiple Choice | C: | None |
| 11 | | TEI Fill in the Blank | 128 | Have students attempt to enter a character that cannot be used as part of the answer. A message will appear that states: “*You cannot use that character.*”  This message will remain on the screen for approximately three seconds. Tell students that the answer does not need to be as long as the response box and a blank space can never be entered into a response box. Also tell them that although this answer is only three digits, answers with four or more digits will be scored as correct with or without the use of commas. If a comma is used, it must be in the correct location within the number. Information for teachers: Equivalent answers would be scored as correct. |
| 12 | | Multiple Choice | A: | None |
| 13 | | TEI Hot Spot | All of these numbers and only these numbers should be selected: . | None |
| 14 | | TEI Hot Spot | All of these answers and only these answers should be selected: . | None |
| 15 | TEI Hot Spot | | All of these answers and only these answers should be selected: | None |
| 16 | Multiple Choice | | B: 15 bows | None |
| 17 | TEI Fill in the Blank | | 90 | None |
| 18 | Multiple Choice | | A: 5.25cm | None |
| 19 | Multiple Choice | | D: | None |
| 20 | TEI In Line Choice | | From top to bottom: 133; 41 | To see the choices select the down arrow next to “Choose. . .” |
| 21 | Multiple Choice | | B: 19.6 sq yd | None |
| 22 | TEI Hot Spot | | All of these answers and only these answers should be selected: 4 meters; 5 meters. | None |
| 23 | TEI Drag and Drop | | Any of these ordered pairs is correct: | None |
| 24 | Multiple Choice | | C: Point *M* | None |
| 25 | Multiple Choice | | C | None |
| 26 | TEI Fill in the Blank | | *TY* | Tell students that this question will only allow two characters to be entered. The characters that can be entered are restricted to these characters: T, t, U, u ,V, v, W, w, X ,x, Y, and y. If a student tries to enter more than two characters or a letter not listed above, a message will appear that states, “*You cannot use that character*.” Information for teachers: YT, yt, and ty would also be considered correct answers. |
| 27 | Multiple Choice | | D: 75 | None |
| 28 | TEI Bar Graph | | Bars should each be raised to these heights:   * Action =15 * Comedy =30 * Other =5 * Musical =10 | In order to answer this item, students must select a bar and drag it to the correct height. If a student wants to change the height, they may select the bar and drag it to a different height.  Once one bar has been moved, the item will appear as “Answered” even if all of the bars are returned to the original heights. |
| 29 | Multiple Choice | | C: 7 letters | None |
| 30 | Multiple Choice | | A | None |
| 31 | Multiple Choice | | D: 108 | None |
| 32 | TEI Fill in the Blank | | 13.5 | Information for teachers: Equivalent answers would be scored as correct (i.e. 13.50). |
| 33 | Multiple Choice | | B: | None |
| 34 | TEI Interactive Number Line | | A ray pointing right with an open circle at 14 | Students must first select a ray. The selected ray will appear on the number line. Then they will drag the endpoint to the correct location. If the students wish to remove what has been graphed, the “Remove” button should be selected. |
| 35 | TEI Equation Editor | | or an equivalent inequality | Students must type a response in the box.  This question will be considered “Answered” once a number or symbol has been placed in the box.  Encourage students to try removing their response and then entering a different expression so they can practice using different operation symbols. Note for teachers: Either the minus or the negative symbol may be used on the palette, and both would score correct. |

## Grade 7 Mathematics

### Section 1

| Question Number | Item Type | Correct Answer | Functionality Description | |
| --- | --- | --- | --- | --- |
| 1 | TEI Drag and Drop | Fraction Form ; Decimal Form 0.01 | Have students select draggers and place them in the empty boxes using the mouse, keypad, or touchscreen. Selecting a dragger and moving it to the empty box may cause the remaining draggers to shift location in the answer option area. Have students select one of the fractions. As they move this number, only the box on the left shades blue, indicating this is the only box that will accept this dragger. Have students try to place a decimal answer into the box on the left. They will not be able to do this. The decimal numbers can only be used in the box on the right. Sometimes a restriction is placed on where a dragger can be placed to limit errors Have students practice moving draggers back to the gray box. Draggers will go back to their original location when returned to the gray box. This item will be considered “Answered” when each box has an answer. | |
| 2 | TEI Hot Spot | The top box and the bottom box must be selected. ; | Notice the “No Calculator” symbol in the top right corner of the screen. This symbol will appear when the calculator is not active on the test item.  If the Desmos Virginia calculator appears on the toolbar, it is an allowable tool for the test item. If the Desmos Virginia calculator does not appear on the toolbar, it is not an allowable tool for the test item.  To answer this question correctly, the two correct answers in the gray box must be selected. A bold blue box outlines the answer choice when it is selected, indicating a student has chosen that response as an answer. In order to deselect an answer and remove the blue box, the answer choice must be selected again. Have students practice selecting and deselecting an answer. This item specifies the number of answers a student must select. If a student tries to select more than the number of answers indicated, a message stating, “*You must remove an answer before you can choose a new one*.” appears in the top right corner of the screen. This message will remain for approximately three seconds unless the “x” is selected to close the message. Have students try to select an additional answer so that they can see this message appear. | |
| 3 | TEI Hot Spot | These three answers, and only these answers, must be selected: ;  ; | | Tell students that when there are an unspecified number of answers, the question will be considered “Answered” when one answer has been selected. This is so no clue or hint is given as to how many answers are correct. |
| 4 | TEI Fill in the Blank | $19.50 | | Have students attempt to enter a character that cannot be used as part of the answer. A message will appear that states, “*You cannot use that character.*” This message will remain on the screen for approximately three seconds. Tell students that the answer does not need to be as long as the response box and a blank space can never be entered into a response box.  Information for teachers: Equivalent answers would be scored as correct. |
| 5 | Multiple Choice | C: $205 | | None |
| 6 | TEI Fill in the Blank |  | | This question has a drawing interaction box. Have students select and practice the various tools.  Information for teachers: Equivalent answers will be scored as correct (e.g., 86.900). |
| 7 | Multiple Choice | D: 78 square inches | | None |
| 8 | Multiple Choice | C: 1,187 sq in | | None |
| 9 | TEI Fill in the Blank | 102 degrees | | None |
| 10 | Multiple Choice | C: a parallelogram that is a rectangle | | None |
| 11 | Multiple Choice | C: Exactly one pair of parallel sides | | None |
| 12 | TEI Drag and Drop | ; ; | | This question will be considered “Answered” when each box has an answer.  In this test question answer options may be used more than one time. Have students try and replace an angle measure with a new angle measure. Students must first remove the angle measure before they can replace it with a different angle measure. |
| 13 | TEI Hot Spot | All of these answers and only these answers should be selected: | | Drawing interaction has been provided on the art image on the left side of the screen. This is to allow students the capability to mark on the grid as needed. The item will not appear as “Answered” until the vertices are plotted on the grid on the right side of the screen. |
| 14 | TEI Fill in the Blank | 1/3 | | Make sure students know to enter the forward slash “/” for the fraction bar. The allowable characters (those that a student can enter) are the numbers 0-9 and the fraction bar. Information for teachers: Equivalent fractions will be scored as correct. |
| 15 | Multiple Choice | A: The theoretical probability of 1/3 is less than the experimental probability. | | None |
| 16 | TEI In Line Choice | From top to bottom: A; C | | To see the choices select the down arrow next to “Choose. . .” This test question has two in-line choice items for students to select. The item will appear “Answered” when both in-line choices have been selected. |
| 17 | Multiple Choice | C: A stem-and-leaf plot because it lists each value in a set of data. | | None |
| 18 | TEI Histogram | Bars should each be raised to these heights:   * Interval 1-10: height of 6; * Interval 11-20: height of 4; * Interval 21-30: height of 4; * Interval 31-40: height of 6 | | In order to answer this item, students must select a bar and drag it to the correct height. If a student wants to change the height, they may select the bar and drag it to a different height.  Once one bar has been moved, the item will appear as “Answered” even if all of the bars are returned to the original heights. |
| 19 | Multiple Choice | D: 3 | | None |
| 20 | TEI Hot Spot | Any two of these points may be plotted: | | This coordinate grid is a type of hot spot technology-enhanced item. Information for teachers: once two points have been plotted a line will connect the two points. The item will appear as answered when the student plots 2 points. |
| 21 | Multiple Choice | C: | | None |
| 22 | Multiple Choice | A: Graph A | | None |
| 23 | Multiple Choice | A: | | None |
| 24 | Multiple Choice | C: 28 | | None |
| 25 | Multiple Choice | D: 4 pencils | | None |
| 26 | TEI Equation Editor | or an equivalent expression | | Students must type a response in the box. Students can type in numbers, operations, and symbols to represent an equivalent equation. They will need to use the forward arrow on the palette to exit the parentheses.  This question will be considered “Answered” once a number or symbol has been placed in the box.  Encourage students to try removing their response and then entering a different equation so they can practice using different numbers, operations, and/or symbols. Note for teachers: Either the minus or the negative symbol may be used on the palette, and both would score correct. |
| 27 | Multiple Choice | D: | | None |
| 28 | Multiple Choice | B | | None |
| 29 | TEI Drag and Drop | The box on the left must contain and the box on the right must contain . | | None |
| 30 | TEI Interactive Number Line | A ray pointing left with a closed circle at 4 | | Students must first select a ray. The selected ray will appear on the number line. Then they will drag the endpoint to the correct location. If the students wish to remove what has been graphed, the “Remove” button should be selected. |
| 31 | Multiple Choice | D | |  |

## Grade 8 Mathematics

| Question Number | Item Type | Correct Answer | Functionality Description |
| --- | --- | --- | --- |
| 1 | TEI Hot Spot | All of these answers must be selected, and only these answers: , , | To answer this question correctly, all correct answers in the gray box must be selected. A bold blue box outlines the answer choice when it is selected, indicating a student has chosen that response as an answer. In order to deselect an answer and remove the blue box, the answer choice must be selected again. Tell students that when there are an unspecified number of answers, the question will be considered “Answered” when one answer has been selected. This is so no clue or hint is given as to how many answers are correct. |
| 2 | TEI Drag and Drop | All answers must be placed in the correct boxes.  On the left: Irrational Numbers  On the right, top to bottom: Rational Numbers, Integers, Whole Numbers, Natural Numbers | Selecting a dragger and moving it to an empty box causes the remaining draggers to shift location in the answer option area.  Have students try to place one dragger “over” another dragger. This cannot be done. If a student wishes to change an answer, the dragger must be moved back to the gray box and another option must be selected and moved into the response box.  This item will be  considered “Answered” when each box has an answer. |
| 3 | TEI Fill in the Blank | 10% | Have students attempt to enter a character that cannot be used as part of the answer. A message will appear that states, “*You cannot use that character.*”  This message will remain on the screen for approximately three seconds. Tell students that the answer does not need to be as long as the response box and a blank space can never be entered into a response box. Information for teachers: Equivalent answers would be scored as correct (i.e., 10.0, 10.00, 10.000). |
| 4 | Multiple Choice | B: 98% | None |
| 5 | Multiple Choice | C: | None |
| 6 | TEI Drag and Drop | All answers must be placed in the correct box, from left to right: 1,3,3,2,4 | This question has a drawing interaction box. Have students select and practice the various tools. |
| 7 | Multiple Choice | A: 196 sq in | None |
| 8 | TEI Hot Spot | These three figures and only these figures should be selected: The middle figure in row1; the first figure in row 2; the middle figure in row 2. | None |
| 9 | Multiple Choice | A: 3 | None |
| 10 | Multiple Choice | C: | None |
| 11 | TEI Hot Spot | These two figures and only these figures should be selected: The second and fourth figure. | This item specifies the number of answers a student must select. If a student tries to select more than the number of answers indicated, a message stating, “*You must remove an answer before you can choose a new one.*” appears in the top right corner of the screen. This message will remain for approximately three seconds unless the “x” is selected to close the message. Have students try to select an additional answer so that they can see this message appear. |
| 12 | Multiple Choice | D: 76 ft | None |
| 13 | Multiple Choice | D: | None |
| 14 | Multiple Choice | B: | None |
| 15 | Multiple Choice | B: Randomly selecting one tile from Bag B, not replacing the tile, then randomly selecting another tile from Bag B | None |
| 16 | Multiple Choice | C: 24% | None |
| 17 | Multiple Choice | A: 1/8 | None |
| 18 | TEI In Line Choice | From top to bottom: replacing it; 36% | To see the choices select the down arrow next to “Choose. . .” |
| 19 | TEI Hot Spot | A point must be plotted on 0.1 (the first tick mark to the right of zero). | This number line model is a type of hot spot technology-enhanced item. Tell students that this question will be considered “Answered” once a point is plotted on the number line. The question cannot return into an “Unanswered” state once a point is plotted. If the student wishes to change an answer, he/she should select another point to replace the original answer. |
| 20 | Multiple Choice | B: Dennis | None |
| 21 | Multiple Choice | B: 2 | None |
| 22 | Multiple Choice | B: The lower extreme increased. | None |
| 23 | Multiple Choice | D: Scatterplot D | None |
| 24 | Multiple Choice | B: 10 | None |
| 25 | TEI Equation Editor | or | Students must type a response in the box. Students can type in numbers, operations, and/or symbols to represent an equivalent expression.  This question will be considered “Answered” once a number or symbol has been placed in the box.  Encourage students to try removing their response and then entering a different expression so they can practice using different operation symbols. Note for teachers: Either the minus or the negative symbol may be used on the palette, and both would score correct. |
| 26 | Multiple Choice | C: { (2, 8), (3, 5) } | None |
| 27 | TEI Equation Editor | Slope  *y*-intercept | Students must type a response in the box.  Note for teachers: Students will need to use the structure box to enter a fraction. This question will be considered “Answered” once a number or symbol has been placed in one of the boxes. |
| 28 | Multiple Choice | C: The number of candy bars sold | None |
| 29 | Multiple Choice | B | None |
| 30 | TEI Fill in the Blank |  | Information for teachers: Equivalent answers would be scored as correct. |
| 31 | Multiple Choice | C: | None |
| 32 | TEI Interactive Number Line | A ray pointing right with a closed circle at | Students must first select a ray. The selected ray will appear on the number line. Then they will drag the endpoint to the correct location. If the students wish to remove what has been graphed, the “Remove” button should be selected. |

## EOC Mathematics - Algebra 1

| Question Number | Item Type | Correct Answer | Functionality Description |
| --- | --- | --- | --- |
| 1 | Multiple Choice | B: 35 | None |
| 2 | Multiple Choice | D: | None |
| 3 | Multiple Choice | D: | None |
| 4 | TEI Hot Spot | All of these answers must be selected, and only these answers: , , | To answer this question correctly, all correct answers in the gray box must be selected. A bold blue box outlines the answer choice when it is selected, indicating a student has chosen that response as an answer. In order to deselect an answer and remove the blue box, the answer choice must be selected again. Tell students that when there are an unspecified number of answers, the question will be considered “Answered” when one answer has been selected. This is so no clue or hint is given as to how many answers are correct. |
| 5 | TEI Equation Editor |  | Students must type a response in the box.  Note for teachers: Students will need to use the structure box to enter an exponent. They will need to use the forward arrow on the palette to exit the radical symbol. This question will be considered “Answered” once a number or symbol has been placed in the box.  Encourage students to try removing their response and then entering a different expression so they can practice using different symbols. |
| 6 | Multiple Choice | C: | None |
| 7 | Multiple Choice | C: 875 | None |
| 8 | TEI Drag and Drop | From left to right: 8;6  Final answer: | Selecting a dragger and moving it to an empty box will not have an effect on the original draggers since each answer may be used more than one time.  Have students try to place one dragger “over” another dragger. This cannot be done. If a student wishes to change an answer, the dragger must be moved back to the gray box and another option must be selected and moved into the response box.  This item will be  considered “Answered” when each box has an answer. |
| 9 | TEI Hot Spot | The equation has no solutions. | This item specifies the number of answers a student must select. If a student tries to select more than the number of answers indicated, a message stating, “*You must remove an answer before you can choose a new one.*” appears in the top right corner of the screen. This message will remain for approximately three seconds unless the “x” is selected to close the message. Have students try to select an additional answer so that they can see this message appear. |
| 10 | TEI Equation Editor | and  Equivalent answers are scored as correct, and answers may be written as ordered pairs. | Students must type a response in the box.  Note for teachers: Students will have to enter a solution before and after the word “and.” This question will be considered “Answered” once a number or symbol has been placed in the box.  Encourage students to try removing their response and then entering a different expression so they can practice using different operation symbols. Either the minus or the negative symbol may be used on the palette, and both would score correct. |
| 11 | TEI Fill in the Blank | The student may enter or . | Have students attempt to enter a character that cannot be used as part of the answer. A message will appear that states, “*You cannot use that character.*”  This message will remain on the screen for approximately three seconds. Tell students that the answer does not need to be as long as the response box and a blank space can never be entered into a response 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.” |
| 12 | TEI Interactive Number Line | A ray pointing left with an open circle at | Students must first select a ray. The selected ray will appear on the number line. Then they will drag the endpoint to the correct location. If the students wish to remove what has been graphed, the “Remove” button should be selected. |
| 13 | Multiple Choice | C | None |
| 14 | TEI Hot Spot | Region 2 should be selected. | This question is a type of hot spot technology-enhanced item. Students must use the hot spot buttons beneath the graph to select the region of the graph to be shaded. Tell students that this item will be considered “Answered” once a region is selected. If the student wishes to change an answer, he/she should select another region or use the eliminator tool to remove the answer. Please tell students If the eliminator tool is used to remove an answer, the shading will remain on the graph until another region has been selected and the item will appear as “Unanswered.” |
| 15 | TEI Drag and Drop | From top to bottom: ; | This question has a drawing interaction box. Have students select and practice the various tools. |
| 16 | TEI In Line Choice | From top to bottom: down; steeper | To see the choices select the down arrow next to “Choose. . .” |
| 17 | TEI In Line Choice | From top to bottom: one-half; two more than | None |
| 18 | TEI Hot Spot | Students should plot any two of these ordered pairs: | This coordinate grid is a type of hot spot technology-enhanced item. Information for teachers: Once two points have been plotted, a line will connect the two points. This question will be considered “Answered” when the line appears. |
| 19 | Multiple Choice | B: 3 | None |
| 20 | TEI Hot Spot | All of these answers must be selected, and only these answers: ; | None |
| 21 | TEI Hot Spot | All of these answers must be selected, and only these answers: -5; | None |
| 22 | Multiple Choice | C | None |
| 23 | TEI Hot Spot | Students should plot any three of these ordered pairs: , |  |
| 24 | Multiple Choice | D: The volume of the gas varies inversely with the pressure because . | None |
| 25 | Multiple Choice | D: It is an inverse variation because . | None |
| 26 | TEI Hot Spot | Students should plot any two of these ordered pairs: | None |
| 27 | Multiple Choice | D: | None |
| 28 | Multiple Choice | D: 91,400 | None |

## EOC Mathematics – Geometry

| Question Number | Item Type | Correct Answer | Functionality Description |
| --- | --- | --- | --- |
| 1 | TEI Drag and Drop | From top to bottom: ; ; | Selecting a dragger and moving it to an empty box causes the remaining draggers to shift location in the answer option area.  Have students try to place one dragger “over” another dragger. This cannot be done. If a student wishes to change an answer, the dragger must be moved back to the gray box and another option must be selected and moved into the response box.  This item will be  considered “Answered” when each box has an answer. |
| 2 | Multiple Choice | C: 0.1 | This question has a drawing interaction box. Have students select and practice the various tools. |
| 3 | Multiple Choice | B: , and are supplementary | None |
| 4 | Multiple Choice | D: | None |
| 5 | TEI Hot Spot | Students should plot any one of these ordered pairs: | This coordinate grid is a type of hot spot technology-enhanced item. Once students have plotted the point, they may remove the point by selecting it again or by plotting a point in a different location. |
| 6 | Multiple Choice | D: | None |
| 7 | TEI Hot Spot | Students should plot points at (-5, -4) and (2, -3). | This pair of coordinate grids provides a type of hot spot technology-enhanced item. The grid on the left provides a workspace with drawing interaction. This question will appear as “Answered” when the vertices are plotted on the grid on the right side of the screen. Once students have plotted a point, they may remove the point by selecting it again, or they may click on the point and drag it to a new location. |
| 8 | Multiple Choice | A: *AE* | None |
| 9 | Multiple Choice | B: Construction B | None |
| 10 | Multiple Choice | D: Point *Z* | None |
| 11 | Multiple Choice | C: is the greatest of the interior angles | None |
| 12 | TEI Equation Editor | 2 < *x* < 15 Equivalent values are scored as correct. | Students must type a compound inequality in the box. This question will be considered “Answered” once a number or symbol has been placed in the box.  Encourage students to try removing their response and then entering a different expression so they can practice using different operation symbols. |
| 13 | Multiple Choice | C: 4 | None |
| 14 | TEI Drag and Drop | From top to bottom:  Reason 2: Base angles of an isosceles triangle are congruent;  Reason 3: Reflexive property;  Reason 4: Angle-Side-Angle (ASA) Postulate | None |
| 15 | TEI Drag and Drop | Statement 3:  ; Reason 4: Angle-Angle (AA) Postulate | None |
| 16 | TEI Hot Spot | Students must select  AND one of the following: , or , or , or . | This item specifies the number of answers a student must select. If a student tries to select more than the number of answers indicated, a message stating, “*You must remove an answer before you can choose a new one.*” appears in the top right corner of the screen. This message will remain for approximately three seconds unless the “x” is selected to close the message. Have students try to select an additional answer so that they can see this message appear. |
| 17 | Multiple Choice | A: | None |
| 18 | TEI Equation Editor | Equivalent equations are scored as correct. | Students must type a response in the box.  Note for teachers: Students will need to use the tangent structure box, the fraction structure box to enter a fraction, and the theta key on the palette.  This question will be considered “Answered” once a number or symbol has been placed in the box.  Encourage students to try removing their response and then entering a different equation so they can practice using different structure boxes and symbols. |
| 19 | TEI Fill in the Blank | Students should enter 8/21 or any fraction equivalent to 8/21. | Make sure students know to enter the forward slash “/” for the fraction bar. Have students attempt to enter a character that cannot be used as part of the answer. A message will appear that states, “*You cannot use that character.*”  This message will remain on the screen for approximately three seconds. This question will be considered “Answered” once a number or symbol has been placed in the box. |
| 20 | Multiple Choice | A: The length of each diagonal is | None |
| 21 | Multiple Choice | A: | None |
| 22 | Multiple Choice | D: | None |
| 23 | Multiple Choice | C: | None |
| 24 | TEI Fill in the Blank | 34 degrees | Tell students that the answer does not need to be as long as the response box, and a blank space can never be entered into a response box. |
| 25 | Multiple Choice | C: 5.78 m | None |
| 26 | Multiple Choice | A: | None |
| 27 | Multiple Choice | D: 616 sq in. | None |
| 28 | Multiple Choice | C: (4, 0) | None |
| 29 | TEI Hot Spot | The center of Circle *O* is located at (0,2) and any of the following points would be correct: | None |
| 30 | TEI Drag and Drop | In order from left to right:  OR | None |
| 31 | Multiple Choice | C: 12 cm | None |
| 32 | TEI Hot Spot | Figure B and Figure C should be selected. | Information for teachers: Since the number of correct answers was specified in the question, this item will show as “Unanswered” on the Review screen if only one answer is selected. This question will be considered “Answered” when two answers have been selected. |
| 33 | TEI Drag and Drop | 2:3 OR 3:2 | Information for teachers: Since the question does not specify the order of comparison (i.e., small to large), both answers are considered correct. |
| 34 | Multiple Choice | A: The volume is decreased by a factor of 1/3. | None |
| 35 | TEI In Line Choice | From top to bottom: 252; 216 | To see the choices select the down arrow next to “Choose. . .” |
| 36 | Multiple Choice | A: 54 cm | None |

## EOC Mathematics – Algebra 2

| Question Number | Item Type | Correct Answer | Functionality Description |
| --- | --- | --- | --- |
| 1 | TEI Drag and Drop | Top box: Bottom box: | Selecting a dragger and moving it to an empty box causes the remaining draggers to shift location in the answer option area.  Have students try to place one dragger “over” another dragger. This cannot be done. If a student wishes to change an answer, the dragger must be moved back to the gray box and another option must be selected and moved into the response box.  This question will show as “Answered” on the 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 Review screen, since the minimum number of draggers to show the question as answered is two. |
| 2 | Multiple Choice | C: | None |
| 3 | Multiple Choice | D: | None |
| 4 | TEI Hot Spot | and | This item specifies the number of answers a student must select. If a student tries to select more than the number of answers indicated, a message stating, “*You must remove an answer before you can choose a new one.*” appears in the top right corner of the screen. This message will remain for approximately three seconds unless the “x” is selected to close the message. Have students try to select an additional answer so that they can see this message appear. |
| 5 | Multiple Choice | A: | None |
| 6 | Multiple Choice | B | None |
| 7 | TEI Interactive Number Line | A ray pointing left with an open circle at 0 and a ray pointing right with an open circle at 4 | Students must first select a ray. The selected ray will appear on the number line. Then they will drag the endpoint to the correct location. If the students wish to remove what has been graphed, the “Remove” button should be selected. |
| 8 | TEI Interactive Number Line | A ray pointing left with an open circle at 0 and a ray pointing right with an open circle at 4 | None |
| 9 | TEI Hot Spot | The student must plot a point on on the number line. | This number line model is a type of hot spot technology-enhanced item. Tell students that this item will be considered “Answered” once a point is plotted on the number line. If the student wishes to change an answer, he/she should select the point again to remove it. |
| 10 | TEI Equation Editor | Equivalent expressions are scored correct. | Students must type a response in the box.  Note for teachers: Students will need to use the radical structure box to enter a radical. Students may use the imaginary unit on the palette or the “i” on the keyboard.  This question will be considered “Answered” once a number or symbol has been placed in the box.  Encourage students to try removing their response and then entering a different expression so they can practice using different structure boxes and symbols. Students will need to use the forward arrow on the palette to exit the radical symbol. Either the minus or the negative symbol may be used on the palette, and both would score correct. |
| 11 | Multiple Choice | D: { } (the empty set) | None |
| 12 | Multiple Choice | C: and | None |
| 13 | TEI Hot Spot | All of these answers must be selected, and only these answers: . | To answer this question correctly, all correct answers in the gray box must be selected. A bold blue box outlines the answer choice when it is selected, indicating a student has chosen that response as an answer. In order to deselect an answer and remove the blue box, the answer choice must be selected again. Tell students that when there are an unspecified number of answers, the question will be considered “Answered” when one answer has been selected. This is so no clue or hint is given as to how many answers are correct. |
| 14 | Multiple Choice | C: | None |
| 15 | TEI Hot Spot | All of these answers must be selected, and only these answers:  ; | This question has a drawing interaction box. Have students select and practice the various tools. |
| 16 | Multiple Choice | Answer D: Graph D | None |
| 17 | Multiple Choice | Answer B: | None |
| 18 | TEI In Line Choice | From top to bottom: reflected over the x-axis; horizontally stretched by a factor of 2, translated up 1 unit | To see the choices select the down arrow next to “Choose. . .” |
| 19 | Multiple Choice | Answer B: | None |
| 20 | TEI Fill in the Blank |  | Have students attempt to enter a character that cannot be used as part of the answer. A message will appear that states, “*You cannot use that character.*”  This message will remain on the screen for approximately three seconds. Tell students that the answer does not need to be as long as the response box and a blank space can never be entered into a response box. This question will be considered “Answered” once a number or symbol has been placed in the box. |
| 21 | TEI Hot Spot | All of these answers must be selected, and only these answers: ; | None |
| 22 | TEI Drag and Drop | Bottom box: | None |
| 23 | TEI Hot Spot | All of these answers must be selected, and only these answers: ; | None |
| 24 | TEI Fill in the Blank |  | Information for teachers: All mathematically equivalent answers to in fraction or decimal form are acceptable as answers for this particular item and would be scored as correct. |
| 25 | Multiple Choice | C: [0, 2) | None |
| 26 | TEI Fill in the Blank | 2.5 or | Make sure students know how to enter the fraction bar, which is the forward slash key (“/”). Information for teachers: All mathematically equivalent answers to 2.5 in fraction or decimal form are acceptable as answers for this particular item and would be scored as correct. |
| 27 | Multiple Choice | one *x*-intercept and no *y*-intercept | None |
| 28 | Multiple Choice | D:  *y* approaches 0 | None |
| 29 | Multiple Choice | A: | None |
| 30 | TEI Drag and Drop | From left to right: | This question will be considered “Answered” when each box contains an answer. |
| 31 | TEI Equation Editor | Equivalent equations are scored correct. | Students must type a response in the box.  Note for teachers: Students will need to use the radical structure box to enter a radical.  This question will be considered “Answered” once a number or symbol has been placed in the box.  Encourage students to try removing their response and then entering a different equation so they can practice using different structure boxes and symbols. Students will need to use the forward arrow on the palette to exit the radical symbol. |
| 32 | TEI Fill in the Blank | 13 | None |
| 33 | Multiple Choice | A: Graph A | None |
| 34 | TEI Hot Spot | All of these answers must be selected, and only these answers: | None |
| 35 | Multiple Choice | B: | None |
| 36 | TEI Fill in the Blank |  | None |
| 37 | TEI Hot Spot | The students should select all of these intervals: 26-28; 28-30; 30-32;  32-34; 34-36; 36-38; 38-40 | This histogram model is a type of hot spot technology-enhanced item. Tell students that this item will be considered “Answered” once one interval is selected. If the student wishes to change an answer, he/she should select the interval again to deselect it. |
| 38 | TEI Fill in the Blank | Students may enter 184, 185, or 186. | None |
| 39 | Multiple Choice | D: 59 | None |
| 40 | Multiple Choice | B: Kelli | None |
| 41 | TEI Fill in the Blank |  | None |
| 42 | TEI Hot Spot | The students may select: Region 3 and Region 4; OR Region 3 and Region 5; OR Region 4 and Region 6; OR Region 5 and Region 6 | None |
| 43 | TEI Fill in the Blank | 63 | None |
| 44 | TEI Fill in the Blank | 336 | None |