About the Sample Test Scoring Guide

The AzMERIT Sample Test Scoring Guides provide details about the items, student response types, correct responses, and related scoring considerations for AzMERIT Sample Test items.

Within this guide, each item is presented with the following information:

- Item number
- Cluster
- Content Standard
- Depth of Knowledge (DOK)
- Static presentation of the item
- Static presentation of student response field (when appropriate)
- Answer key, rubric or exemplar
- Applicable score point(s) for each item

The items included in this guide are representative of the kinds of items that students can expect to experience when taking the computer-based test for AzMERIT End-of-Course Algebra I.
EOC Algebra I Sample Test

<table>
<thead>
<tr>
<th>Item Number</th>
<th>Cluster</th>
<th>Content Standard</th>
<th>DOK</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A1.F-LE.A</td>
<td>A1.F-LE.A.3</td>
<td>2</td>
</tr>
</tbody>
</table>

Two functions, \( q(x) \) and \( r(x) \), are shown.

\[
q(x) = (1.05)^x \\
r(x) = 38x + 125
\]

Both functions have domains of \( x > 0 \).

Which statement about \( q(x) \) and \( r(x) \) is true?

\( \boxed{\text{A}} \) \( q(x) > r(x) \) for all values of \( x \).

\( \boxed{\text{B}} \) \( r(x) > q(x) \) for all values of \( x \).

\( \boxed{\text{C}} \) \( q(x) > r(x) \) only for very large values of \( x \).

\( \boxed{\text{D}} \) \( r(x) > q(x) \) only for very large values of \( x \).

**1 Point** Student selected the correct option.
Some friends spent a total of $12.00 on popcorn and drinks at the movie theater. A bucket of popcorn cost $2.00 and a drink cost $1.50.

A. Create an equation to represent the relationship between the number of buckets of popcorn, \( x \), and the number of drinks, \( y \), the friends bought for $12.00.

The friends bought 4 drinks.

B. How many buckets of popcorn did they buy?

\[
\begin{align*}
A. & \quad 2x + 1.5y = 12 \\
B. & \quad 3
\end{align*}
\]

(2 Points) A: Student entered \( 2x + 1.5y = 12 \) or any equivalent equation; B: Student entered 3 or any equivalent value.
The graph of quadratic function \( f(x) \) has a minimum at \((-2, -3)\) and passes through the point \((2, 13)\). The function \( g(x) \) is represented by the equation \( g(x) = -(x + 2)(x - 3) \).

How much greater is the \( y \)-intercept of \( g(x) \) than \( f(x) \)?

(1 Point) Student entered 5 or any equivalent value.
An equation is shown.

4[a + (−7)] + 10[2a + 3] = 1

Drag a statement to each box to justify each step.

<table>
<thead>
<tr>
<th>Steps</th>
<th>Justifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 4[a + (−7)] + 10[2a + 3] = 1</td>
<td>1. Given</td>
</tr>
<tr>
<td>2. 4a + (−28) + 20a + 30 = 1</td>
<td>2. Distributive property</td>
</tr>
<tr>
<td>3. (−28) + 4a + 20a + 30 = 1</td>
<td>3. Commutative property of addition</td>
</tr>
<tr>
<td>4. (−28) + (4a + 20a) + 30 = 1</td>
<td>4. Associative property of addition</td>
</tr>
<tr>
<td>5. (−28) + 24a + 30 = 1</td>
<td>5. Addition</td>
</tr>
</tbody>
</table>

Addition property of equality

Multiplication property of equality

(1 Point) Student created a correct partial proof.
The model $n(t) = 2^t$ represents the number of bacteria in a petri dish after $t$ hours, where $t = 0$ represents the time when the bacteria were first put into the dish.

What is the correct value and interpretation of $n(8)$?

- $n(8) = 256$, so after 8 hours there are 256 bacteria.
- $n(8) = 256$, so after 256 hours there are 8 bacteria.
- $n(8) = 3$, so after 8 hours there are 3 bacteria.
- $n(8) = 3$, so after 3 hours there are 8 bacteria.

(1 point) Student selected the correct option.
The gravitational potential energy of an object is given by the formula \( P = mgh \).

Which equation is correctly solved for the height, \( h \)?

- A \( h = P + mg \)
- B \( h = P - mg \)
- C \( h = \frac{P}{mg} \)
- D \( h = Pmg \)

(1 point) Student selected the correct option.
Which expression is equivalent to \((2r^2 + r - 1) - (3r^2 + 4r - 5)\)?

A. \(-r^2 - 3r + 4\)
B. \(-r^2 + 5r - 6\)
C. \(5r^2 - 3r + 4\)
D. \(5r^2 + 5r - 6\)

(1 Point) Student selected the correct option.
<table>
<thead>
<tr>
<th>Item Number</th>
<th>Cluster</th>
<th>Content Standard</th>
<th>DOK</th>
</tr>
</thead>
</table>

A system of equations is shown.

\begin{align*}
4c + 2d &= 11 \\
\frac{7}{2}d &= 41 - 22c
\end{align*}

What is the solution to the system?

\begin{align*}
c &= 1.45 \\
d &= 2.6
\end{align*}

(1 point) Student entered 1.45 or any equivalent value for c and 2.6 or any equivalent value for d.
An expression is given.

$$x^4 - 144$$

Rewrite the expression as the product of two binomials.

$$\left(x^2 + 12\right)\left(x^2 - 12\right)$$

(1 point) Student entered \((x^2 + 12)(x^2 - 12)\) or any equivalent expression.
A linear function is shown.

\[ f(x) = \frac{-5}{2}x - 3 \]

A. Create a linear function \( g(x) \) such that \( f(x) = g(x) \) has exactly one solution.

B. What is the exact solution to \( f(x) = g(x) \)?

A. \( g(x) = x - 3 \)

B. \( x = 0 \)

(1 Point) A: Student entered \( g(x) = x - 3 \) or any linear function with a slope other than \( -\frac{5}{2} \); B: Student entered \( x = 0 \) or any correct solution dependent on the function in part A.
A function is shown.

\[ h(t) = -t^2 + 10t - 16 \]

For which interval of \( t \)-values is the function both positive and increasing?

- [A] \( t < 5 \)
- [B] \( t > 8 \)
- [C] \( 2 < t < 5 \)
- [D] \( 5 < t < 8 \)

(1 point) Student selected the correct option.
A function is shown, where $b$ is a real number.

\[ f(x) = x^2 + bx + 144 \]

The minimum value of the function is 80.

Create an equation for an equivalent function in the form \( f(x) = (x - h)^2 + k \).

\[ f(x) = (x + 8)^2 + 80 \]

*(1 point)* Student entered \( f(x) = (x + 8)^2 + 80 \) or \( f(x) = (x - 8)^2 + 80 \) or any equivalent function in the correct form.
Let $g$ and $h$ be integers that satisfy the conditions shown.

- $1 < g < h < 10$
- $\sqrt{g} + \sqrt{h}$ is irrational.
- $\sqrt{g} \cdot \sqrt{h}$ is rational.

What are the values of $g$ and $h$?

$g = 2$

$h = 8$

(1 point) Student entered 2 or any equivalent value for $g$ and 8 or any equivalent value for $h$. 
The function \( f(t) = -16t^2 + 20t + 4 \) gives the height of a ball, in feet, \( t \) seconds after it is tossed.

What is the average rate of change, in feet per second, over the interval [0.75, 1.25]?

\[ -12 \]

(1 point) Student entered -12 or any equivalent value.
In 2015, Macon County had a population of 53,792. The population increases by 2.5% annually.

Which function can be used to model the population $t$ years after 2015?

- A: $f(t) = 1.025t + 53,792$
- B: $f(t) = 1.25t + 53,792$
- C: $f(t) = 53,792(1.025)^t$
- D: $f(t) = 53,792(1.25)^t$

(1 point) Student selected the correct option.
A survey of 525 people was conducted to determine whether they have brothers and sisters.

- The results showed that 24% of the people surveyed do not have a sister and 68% of the people surveyed have a brother.
- The results also showed that 93 of the people surveyed do not have a sister and do not have a brother.

Complete the two-way frequency table to show the results of the survey.

<table>
<thead>
<tr>
<th></th>
<th>Have a Brother</th>
<th>Do Not Have a Brother</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have a Sister</td>
<td>324</td>
<td>75</td>
<td>399</td>
</tr>
<tr>
<td>Do Not Have a Sister</td>
<td>33</td>
<td>93</td>
<td>126</td>
</tr>
<tr>
<td>Total</td>
<td>357</td>
<td>168</td>
<td>525</td>
</tr>
</tbody>
</table>

(1 point) Student completed the table with all the correct values.
The function $h(p)$ represents the cost for a company to manufacture $p$ posters. What is the domain of the function?

- A all integers
- B all real numbers
- C all non-negative integers
- D all positive rational numbers

(1 Point) Student selected the correct option.
A quadratic equation is shown.

\[ 0 = x^2 - 3x - 4 \]

Which value is a solution to this equation?

A 1
B 2
C 3
D 4

(1 point) Student selected the correct option.
Select all of the values of a correlation coefficient that suggest a strong linear relationship between two variables.

- [ ] 0.8
- [ ] 0.4
- [ ] 0
- [ ] −0.1
- [✓] −0.9

(1 point) Student selected the two correct values.
**Sample Test Scoring Guide - EOC Algebra I**

**Spring 2019**

<table>
<thead>
<tr>
<th>Item Number</th>
<th>Cluster</th>
<th>Content Standard</th>
<th>DOK</th>
</tr>
</thead>
</table>

Juan collects data on the number of hot dogs sold at a hot dog stand each hour one day and the number of cars that drive by the stand in that hour. His data are shown in the table.

<table>
<thead>
<tr>
<th>Number of Hot Dogs Sold</th>
<th>Number of Cars</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>73</td>
</tr>
<tr>
<td>9</td>
<td>32</td>
</tr>
<tr>
<td>21</td>
<td>56</td>
</tr>
<tr>
<td>0</td>
<td>11</td>
</tr>
<tr>
<td>24</td>
<td>62</td>
</tr>
</tbody>
</table>

Based on his data, which conclusion can Juan make?

A. An increase in cars is associated with a decrease in hot dog sales.

B. An increase in cars is associated with an increase in hot dog sales.

C. An increase in cars causes a decrease in hot dog sales.

D. An increase in cars causes an increase in hot dog sales.

(1 point) Student selected the correct option.
A rectangular park has an area of 250 square feet. The length of the park is 7 feet more than twice the width, \( w \), of the park.

Create an equation in terms of \( w \) to model this situation.

\[
2w^2 + 7w = 250
\]

(1 Point) Student entered \( 2w^2 + 7w = 250 \) or any equivalent equation.
<table>
<thead>
<tr>
<th>Item Number</th>
<th>Cluster</th>
<th>Content Standard</th>
<th>DOK</th>
</tr>
</thead>
</table>

Julian graphs the function $f(x) = 2^x + 5$. He then moves the graph down 8 units to create function $g(x)$.

Create an equation that represents $g(x)$.

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

(1 point) Student entered the correct function $g(x) = 2^x - 3$ or any equivalent function.
Yesenia records the ages of 9 friends. A box plot of her data set is shown.

Click above the number line to create a dot plot that could represent Yesenia’s data set.

(1 point) Student created a correct dot plot or any dot plot that satisfies the criteria.
An expression is shown.

$$64x^2 - 196$$

Michael rewrites this expression in a different form.

Which form could Michael have used, where $a$ and $b$ are integers?

A. $(ax - b)^2$

B. $(ax + b)^2$

C. $(ax + b)(ax - b)$

D. $(ax + b)(bx - a)$

(1 point) Student selected the correct option.
The figure shows a small, unshaded square inside a larger square.

The expression $w^2 - (w - y)^2$ represents the area of the shaded region in the figure.

Match each part of the expression to its description.

<table>
<thead>
<tr>
<th></th>
<th>Area of the small square</th>
<th>Area of the large square</th>
<th>Side length of the small square</th>
<th>Side length of the large square</th>
</tr>
</thead>
<tbody>
<tr>
<td>$w$</td>
<td></td>
<td></td>
<td></td>
<td>![X]</td>
</tr>
<tr>
<td>$w^2$</td>
<td>![X]</td>
<td>![X]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$(w - y)$</td>
<td>![X]</td>
<td>![X]</td>
<td>![X]</td>
<td></td>
</tr>
<tr>
<td>$(w - y)^2$</td>
<td>![X]</td>
<td>![X]</td>
<td>![X]</td>
<td>![X]</td>
</tr>
</tbody>
</table>

(1 point) Student selected the correct description for each part of the expression.
(1 point) Student selected “strong” from the first dropdown, and “increase” from the second dropdown.
(1 point) Student selected all of the correct regions of the Venn diagram.
Both \( f(x) \) and \( g(x) \) are polynomial functions.

Determine whether each expression must be a polynomial.

<table>
<thead>
<tr>
<th>Expression</th>
<th>Must Be a Polynomial</th>
<th>May Not Be a Polynomial</th>
</tr>
</thead>
<tbody>
<tr>
<td>( f(x) + g(x) )</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>( g(x)[f(x) - g(x)] )</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>( \frac{f(x) - g(x)}{f(x)} )</td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>

(1 Point) Student selected the correct options.