Algebra 1

Sample Test Materials

The purpose of these sample test materials is to orient teachers and students to the types of paper-based B.E.S.T. Algebra 1 questions. By using these materials, students will become familiar with the types of items and response formats they may see on a paper-based test. The sample items and answers are not intended to demonstrate the length of the actual test, nor should student responses be used as an indicator of student performance on the actual test. The sample test materials are not intended to guide classroom instruction.

Use the space in this Test and Response Book to do your work. Then, completely fill in the bubble beside the answer you choose. For some items, filling in more than one bubble may be required, so read each item carefully. If you change your answer, be sure to erase completely.

Some items will ask you to write a response in a shaded box or boxes. See the sample item below.

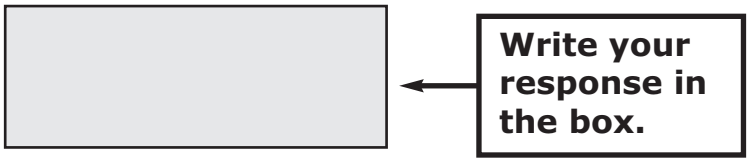
Sample Item:

An expression is shown.

$$(22.4)(2.65)$$

What is the value of the expression?

Write your response in the shaded box below.



Some items may have more than one box, so read each item carefully. Your answers for the items with response boxes may contain whole numbers, fractions, decimals, or negative numbers.

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B.E.S.T. Algebra 1 EOC Mathematics Reference Sheet

Customary Conversions

1 foot = 12 inches
1 yard = 3 feet
1 mile = 5,280 feet
1 mile = 1,760 yards

1 cup = 8 fluid ounces
1 pint = 2 cups
1 quart = 2 pints
1 gallon = 4 quarts

1 pound = 16 ounces
1 ton = 2,000 pounds

Metric Conversions

1 meter = 100 centimeters
1 meter = 1000 millimeters
1 kilometer = 1000 meters

1 liter = 1000 milliliters

1 gram = 1000 milligrams
1 kilogram = 1000 grams

Time Conversions

1 minute = 60 seconds
1 hour = 60 minutes
1 day = 24 hours
1 year = 365 days
1 year = 52 weeks

DO NOT REMOVE THIS SHEET

Formulas

Forms of Linear Equations	Forms of Quadratic Functions	Forms of Exponential Functions
$y = mx + b$ $Ax + By = C$ $y - y_1 = m(x - x_1)$	$f(x) = ax^2 + bx + c$ $f(x) = a(x - h)^2 + k$ $f(x) = a(x - p)(x - q)$	$f(x) = ab^x$ $f(x) = a(1 \pm r)^x$

Quadratic Formula
$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ where $ax^2 + bx + c = 0$ and $a \neq 0$

Final Amounts under Simple Interest	Final Amounts under Compound Interest
$A = P(1 + rt)$ where P = principal, r = rate, and t = time	$A = P\left(1 + \frac{r}{n}\right)^{nt}$ where P = principal, r = rate, n = number of times compounded, and t = time

1. A band sells x premium tickets and y regular tickets for a concert.

- A premium ticket costs $20.
- A regular ticket costs $5 less than a premium ticket.
- The band raises $2145 from selling tickets.

Select coefficients to complete the equation representing the relationship between x and y. For each box, fill in the bubble before the number that is correct.

Ⓐ 5 Ⓑ 15 Ⓒ 20 Ⓓ 25	$x +$	Ⓐ 5 Ⓑ 15 Ⓒ 20 Ⓓ 25	$y = 2145$

Go On

2. A function is shown.

$$f(x) = 2x + 1$$

Select all the effects on the graph of the function when $f(x)$ is multiplied by 3.

Ⓐ The x-intercept increases.

Ⓑ The x-intercept decreases.

Ⓒ The y-intercept increases.

Ⓓ The y-intercept decreases.

Ⓔ The slope increases.

Ⓕ The slope decreases.

Go On

3. The expression $15{,}000(1 + 0.02)^m$ can be used to model the sales, in dollars, of a company after m months.

The value 12 was substituted for m to create the expression $15{,}000(1 + 0.02)^{12}$.

Write your response in the shaded box below and fill in the bubble before the correct unit to complete the sentence.

The expression $(1 + 0.02)^{12}$ represents the growth factor of the company's sales for a period of time

lasting [ ] [Ⓐ day(s) Ⓑ month(s) Ⓒ year(s)].

Go On

4. A table of values for a linear function is shown.

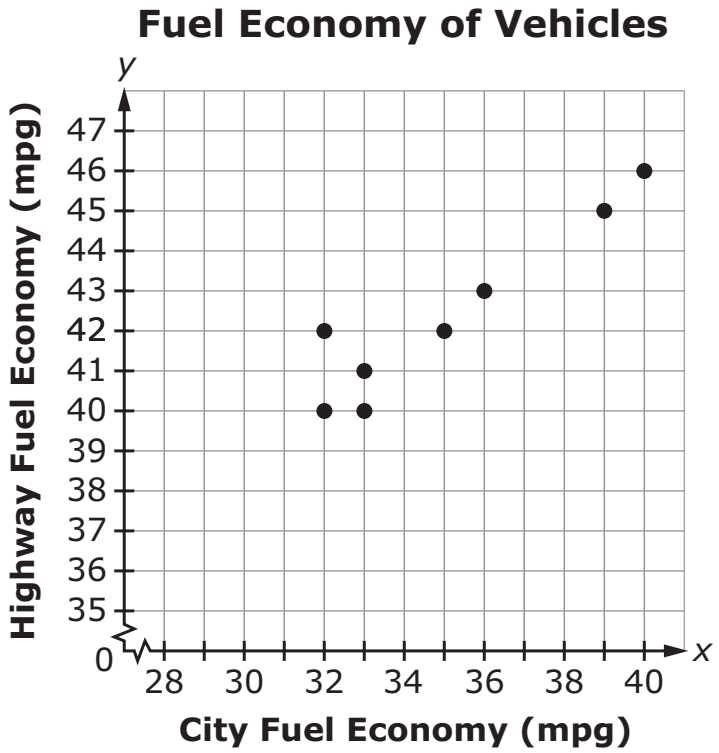
x	$f(x)$
–1	–8
3	0
6	6

Fill in bubbles to match each key feature of the graph to its value.

	–6	**$\frac{1}{2}$**	**2**	**3**	**6**
***x*-intercept**	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
***y*-intercept**	Ⓕ	Ⓖ	Ⓗ	Ⓘ	Ⓙ
rate of change	Ⓚ	Ⓛ	Ⓜ	Ⓝ	Ⓞ

Go On

5. The fuel economy of a car is its average distance traveled per amount of fuel consumed. Cars have different fuel economies when they are driven in the city and on the highway. A linear model of the relationship between the city and highway fuel economies of eight cars, in miles per gallon (mpg), is shown.



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This question has **two** parts.

Part A

Which linear equation best models the scatter plot?

Ⓐ $y = \frac{2}{3}x + 19$

Ⓑ $y = \frac{6}{8}x + 25$

Ⓒ $y = \frac{3}{2}x + 19$

Ⓓ $y = \frac{8}{6}x + 25$

Part B

Based on the model in Part A, what could be the highway fuel economy, in mpg, of a car that has a city fuel economy of 43 mpg? Round your answer to the nearest hundredth.

Write your response in the shaded box below.

6. The table shown represents two functions, Function A and Function B.

x	Function A	Function B
0	700	600
1	750	624
10	1200	888*
20	1700	1315*

*rounded value

Complete the sentences to compare the two functions. For each blank, fill in the bubble **before** the word or phrase that is correct.

Function A appears to grow _____ [Ⓐ linearly Ⓑ exponentially].

Function B appears to grow _____ [Ⓐ linearly Ⓑ exponentially].

As *x* increases, the quantities for _____ [Ⓐ Function A Ⓑ Function B] will eventually exceed the quantities for _____ [Ⓐ Function A Ⓑ Function B].

Go On

7. In a survey of 3,260 people, 57% of people said they spend more than 2 hours a day on their smartphones. The margin of error is ±2.2%. The survey is used to estimate the number of people in a town of 17,247 who spend more than 2 hours a day on their smartphones.

Based on the survey, what are the estimated minimum and maximum numbers of people in the town who spend more than 2 hours a day on their smartphones? Round your answers to the nearest whole numbers.

Write your responses in the shaded boxes below.

Minimum:

Maximum:

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