2023–2024 Algebra I Benchmark Unit 1

Answer Key

Question 1.

Drag and drop the tiles below to show which process was used to obtain the answer shown.

$2(x + 4) = 30$

Step 1: $2x + 8 = 30$ *multiply by*

Step 2: $2x = 22$ *subtract 8*

Step 3: $x = 11$ *divide by 2*

divide by 2 | multiply by | subtract 8

• 1 Point

Standards

A-REI.A.1

Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.

Skills	Topics	Other	District Tags
			Math:Math Fluency

Question 2. D – 1 Point

Standards

A-CED.A.2

Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.

Skills	Topics	Other	District Tags
			Math:Math Fluency

Question 3. D – 1 Point

Standards

A-CED.A.4

Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.

Skills	Topics	Other	District Tags
			Math:Math Fluency

Question 4. B – 1 Point

Standards

A-CED.A.4

Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.

Skills	Topics	Other	District Tags
			Math:Math Fluency

Question 5. A - 1 Point

Standards

F-IF.A.1
Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then f(x) denotes the output of f corresponding to the input x. The graph of f is the graph of the equation y = f(x).

Skills	Topics	Other	District Tags
			Math:Math Fluency

Question 6. A - 1 Point

Standards

2
Reason abstractly and quantitatively.
F-IF.B.5
Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.
HSF-IF.5
Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.
MP.2
Reason abstractly and quantitatively.

Skills	Topics	Other	District Tags
			Math:Math Fluency

Question 7. C - 1 Point

Standards

HSS-ID.B.6.a
Fit a function to the data; use functions fitted to data to solve problems in the context of the data.

Skills	Topics	Other	District Tags
			Math:Math Fluency

Question 8. D - 1 Point

Standards

A-REI.B.3
Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

Skills	Topics	Other	District Tags
			Math:Math Process

Question 9. B - 1 Point

Standards

1
Make sense of problems and persevere in solving them.
5
Use appropriate tools strategically.
A-REI.B.3
Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
HSA-REI.B.3
Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
MP.1
Make sense of problems and persevere in solving them.
MP.5
Use appropriate tools strategically.

Skills	Topics	Other	District Tags
			Math:Math Process

Question 10. D - 1 Point

Standards

F-IF.A.1
Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then f(x) denotes the output of f corresponding to the input x. The graph of f is the graph of the equation y = f(x).

Skills	Topics	Other	District Tags
			Math:Math Process

Question 11. A - 1 Point

Standards

F-IF.C.7a
Graph linear and quadratic functions and show intercepts, maxima, and minima.

Skills	Topics	Other	District Tags
			Math:Math Process

Question 12.

Place the number that **best** completes the sentence.

The table shows the relationship between calories and fat grams contained in orders of fried chicken from various restaurants.

Calories	305	410	320	500	510	440
Fat (grams)	28	34	28	41	42	38

These data show positive correlation and can be fit to a linear function.

0.05	0.09	5.9	11.9

The average number of fat grams per calorie is

0.09 .

• 1 Point

Standards

S-ID.C.7
Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.

Skills	Topics	Other	District Tags
			Math:Math Process

Question 13. B – 1 Point

Standards

S-ID.C.8
Compute (using technology) and interpret the correlation coefficient of a linear fit.

Skills	Topics	Other	District Tags
			Math:Math Process

Question 14. A – 1 Point

Standards

A-REI.D.10
Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).

Skills	Topics	Other	District Tags
			Math:Math Process

Question 15. C – 1 Point

Standards

A-CED.A.1
Create equations and inequalities in one variable and use them to solve problems.

Skills	Topics	Other	District Tags
			Math:Math Application

Question 16. D – 1 Point

Standards

A-CED.A.2
Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.

Skills	Topics	Other	District Tags
			Math:Math Application

Question 17. A – 1 Point

Standards

F-IF.A.2
Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.

Skills	Topics	Other	District Tags
			Math:Math Application

Question 18.

Place the option that correctly completes the sentence.

At cruising speed, a car burns fuel at a rate of 2.5 kilograms per hour. The initial mass of the car and the fuel is 1550 kg. The mass of the car when the fuel tank is empty is 1520 kg. The function $m(t)$ defines the change in mass with time.

all real numbers	$t \geq 0$	$0 \leq t \leq 1550$	$0 \leq t \leq 12$

The domain of the function $m(t)$ is best described as

$0 \leq t \leq 12$.

• 1 Point

Standards

F-IF.B.5
Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.

Skills	Topics	Other	District Tags
			Math:Math Application

Question 19. A – 1 Point

Standards

F-BF.A.1a
Determine an explicit expression, a recursive process, or steps for calculation from a context.

Skills	Topics	Other	District Tags
			Math:Math Application

Question 20. O - 1 Point

Standards

F-BF.A.1a
Determine an explicit expression, a recursive process, or steps for calculation from a context.

Skills	Topics	Other	District Tags
			Math:Math Application

Question 21. D - 1 Point

Standards

S-ID.C.7
Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.

Skills	Topics	Other	District Tags
			Math:Math Application

Question 22.

Response 1: Answer Correct 1 - 1 Point

Response 2: O - 2 Points

Standards

S-ID.B.6a
Fit a function to the data (including with the use of technology); use functions fitted to data to solve problems in the context of the data.

Skills	Topics	Other	District Tags
			Math:Math Application