

MATHEMATICS ALGEBRA I

TEKS/TAKS Open Ended and Multiple Choice Questions Organized by TEKS

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ALGEBRA I TEKS/TAKS OPEN ENDED AND MULTIPLE-CHOICE QUESTIONS
Table of Contents and TEKS/TAKS Correlation

TAKS OBJ	TEKS	OPEN ENDED AND MULTIPLE CHOICE	STUDENT EXPECTATION
1	01-A.1A	01-A.1A 02-A.1A 03-A.1A 04-A.1A	Describe independent and dependent quantities in relationships
1	02-A.1B	01-A.1B 02-A.1B 03-A.1B 04-A.1B	Gather and record data ns use data sets to determine functional relationships
1	03-A.1C	01-A.1C 02-A.1C 03-A.1C 04-A.1C	Describe functional relationships using equations and inequalities
1	04-A.1D	01-A.1D 02-A.1D 03-A.1D 04-A.1D	Represents relationships among quantities using models, tables, graphs, diagrams, verbal descriptions, equations and inequalities.
1	05-A.1E	01-A.1E 02-A.1E 03-A.1E 04-A.1E	Interpret and make inferences from functional relationships
2	01-A.2A	01-A.2A 02-A.2A 03-A.2A 04-A.2A	Identify the general forms of the linear and quadratic parent functions
2	02-A.2B	01-A.2B 02-A.2B 03-A.2B 04-A.2B	Identify mathematical domains and ranges
2	03-A.2C	01-A.2C 02-A.2C 03-A.2C 04-A.2C	Interpret situations in terms of graphs
2	04-A.2D	01-A.2D 02-A.2D 03-A.2D 04-A.2D	Interpret scatterplots and models and predict and make decisions
2	05-A.3A	01-A.3A 02-A.3A 03-A.3A 04-A.3A	Use symbols to represent unknowns
2	06-A.3B	01-A.3B 02-A.3B 03-A.3B 04-A.3B	Look for patterns and represent generalizations algebraically

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2	07-A.4A	01-A.4A 02-A.4A 03-A.4A 04-A.4A	Find specific function values , simplify polynomial expressions, solve equations and factor
2	08-A.4B	01-A.4B 02-A.4B 03-A.4B 04-A.4B	Use commutative, associative and distributive properties
3	01-A.5A	01-A.5A 02-A.5A 03-A.5A 04-A.5A	Determine if situations can be represented by linear functions
3	02-A.5C	01-A.5C 02-A.5C 03-A.5C 04-A.5C	Translate among and use tabular, graphical, or verbal descriptions
3	03-A.6A	01-A.6A 02-A.6A 03-A.6A 04-A.6A	Develop concept of slope and determine slope from graphs, tables and algebraic representations
3	04-A.6B	01-A.6B 02-A.6B 03-A.6B 04-A.6B	Interpret the meaning of slope and intercepts using data, symbolic representation and graphs
3	05-A.6C	01-A.6C 02-A.6C 03-A.6C 04-A.6C	Investigate the effects of changes in m and b on the graph of $y = mx + b$
3	06-A.6D	01-A.6D 02-A.6D 03-A.6D 04-A.6D	Graph and write equations of lines given two points, a point and a slope or the slope and the y -intercept
3	07-A.6E	01-A.6E 02-A.6E 03-A.6E 04-A.6E	Determine intercepts from graphs, tables, or algebraic representation
3	08-A.6F	01-A.6F 02-A.6F 03-A.6F 04-A.6F	Interpret and predict the effects of changing slope and y -intercept
3	09-A.6G	01-A.6G 02-A.6G 03-A.6G 04-A.6G	Relate direct variation and solve problems involving proportional change

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4	01-A.7A	01-A.7A 02-A.7A 03-A.7A 04-A.7A	Analyze situations involving linear functions and formulate linear equations and inequalities
4	02-A.7B	01-A.7B 02-A.7B 03-A.7B 04-A.7B	Investigate methods for solving linear functions
4	03-A.7C	01-A.7C 02-A.7C 03-A.7C 04-A.7C	Determine the reasonableness of solutions
4	04-A.8A	01-A.8A 02-A.8A 03-A.8A 04-A.8A	Formulate system of linear equations to solve problems
4	05-A.8B	01-A.8B 02-A.8B 03-A.8B	Solve systems of linear equations
4	06-A.8C	01-A.8C 02-A.8C 03-A.8C	Interpret and determine reasonableness of solutions of equations
5	01-A.9B	01-A.9B 02-A.9B 03-A.9B	Investigate, describe, and predict the effects of changes of a on the graph of $y = ax^2 + c$
5	02-A.9C	01-A.9C 02-A.9C 03-A.9C 04-A.9C	Investigate, describe, and predict the effects of changes of c on the graph of $y = ax^2 + c$
5	03-A.9D	01-A.9D 02-A.9D 03-A.9D	Analyze the graphs of quadratic functions and draw conclusions
5	04-A.10A	01-A.10A 02-A.10A 03-A.10A	Solve quadratic equations
5	05-A.10B	01-A.10B 02-A.10B 03-A.10B	Make connections among the solutions of quadratic equations, the zeros of their related functions, and the horizontal intercepts of the graph of a function
5	06-A.11A	01-A.11A 02-A.11A 03-A.11A 04-A.11A	Use patterns to generate the laws of exponents and apply them

The chart shows the prices of a large pizza with different numbers of toppings.

Pizza Prices

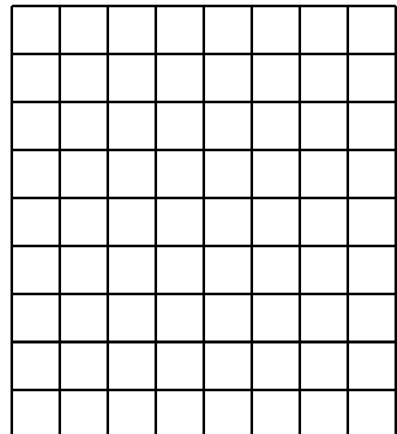
Number of Toppings	Total Price
1	\$9.00
2	\$11.50
3	\$14.00
4	\$16.50
t	P

- Write an equation that shows the relationship between the total price, P , and the number toppings, t .
- Which quantity is the independent quantity in this relationship?

1. What skills, concepts and vocabulary must I understand to answer this problem?
2. Is a calculator of benefit to me on this problem? If so, how?
3. Will the TAKS Mathematics Formula chart be of benefit to me on this problem? If so, how?
4. What problem-solving strategy or strategies do I perceive I might use to solve this problem?
5. **Extension A.2A and A.5B:** Plot the data on a grid. Be sure to label the axes and give the scale. What type of graph does the data generate? _____

What does the slope represent? _____

What does the y-intercept represent? _____



The chart shows the prices of a large pizza with different numbers of toppings.

Pizza Prices

Number of Toppings	Total Price
1	\$9.00
2	\$11.50
3	\$14.00
4	\$16.50
t	P

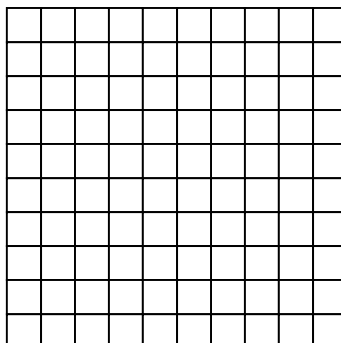
- Write an equation that shows the relationship between the total price, P , and the number toppings, t .
- Which quantity is the independent quantity in this relationship?

The table shows the prices of a corsage with different numbers of flowers at Lulu's Flower Shop.

Number of Flowers	Total Price
1	\$3.85
2	\$5.60
3	\$7.35
4	\$9.10
f	P

- Write an equation that shows the relationship between the total price, P , and the number of flowers, f .
- Determine the cost of 2 corsages if one has 5 flowers and the other has 7 flowers. Show your work.
- Is the data in the table a proportional relationship? How do you know?

1. What skills, concepts and vocabulary must I understand to answer this problem?
2. Is a calculator of benefit to me on this problem? If so, how?
3. Will the TAKS Mathematics Formula chart be of benefit to me on this problem? If so, how?
4. What problem-solving strategy or strategies do I perceive I might use to solve this problem?
5. **Extension A.2A:** Plot the data on a coordinate grid. Be sure to label the axes. What type of graph does the data generate?



The table shows the prices of a corsage with different numbers of flowers at Lulu's Flower Shop.

Corsage Prices

Number of Flowers	Total Price
1	\$3.85
2	\$5.60
3	\$7.35
4	\$9.10
f	P

- Write an equation that shows the relationship between the total price, P , and the number of flowers, f .
- Determine the cost of 2 corsages if one has 5 flowers and the other has 7 flowers. Show your work.
- Is the data in the table a proportional relationship? How do you know?

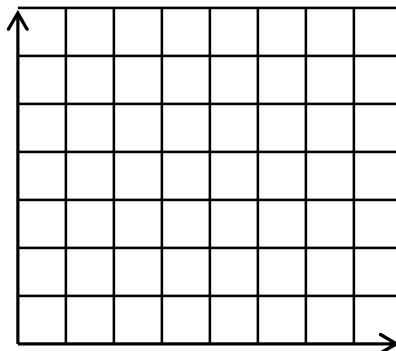
The chart shows the prices of a large pizza with different numbers of toppings.

Pizza Prices

Number of Toppings	Total Price
1	\$7.50
2	\$10.00
3	\$12.50
4	\$15.00
t	P

- Write an equation that shows the relationship between the total price, P , and the number toppings, t .
- Use your equation to determine the cost of a pizza with 8 toppings. Show your work to support your answer.

1. What skills, concepts and vocabulary must I understand to answer this problem?
2. Is a calculator of benefit to me on this problem? If so, how?
3. Will the TAKS Mathematics Formula chart be of benefit to me on this problem? If so, how?
4. What problem-solving strategy or strategies do I perceive I might use to solve this problem?
5. **Extension A.2A:** Plot the data from the table above on a coordinate grid. Be sure to label the axes. What type of graph does the data generate?



The chart shows the prices of a large pizza with different numbers of toppings.

Pizza Prices

Number of Toppings	Total Price
1	\$7.50
2	\$10.00
3	\$12.50
4	\$15.00
t	P

- Write an equation that shows the relationship between the total price, P , and the number toppings, t .
- Use your equation to determine the cost of a pizza with 8 toppings. Show your work to support your answer.

Which equation best represents the data in the table?

x	y
-3	-11
-2	-6
0	-2
2	-6
3	-11

- A $y = -x^2 - 2$
 B $y = x^2 + 3$
 C $y = -x^2 + 3$
 D $y = -(x^2 + 3)$

Michelle kept a log of the number of hours she spent shopping on vacation and the cumulative total number of souvenirs she bought.

Number of Souvenirs

Number of Hours, x	1	3	4	8
Number of Souvenirs Bought, y	3	7	9	17

Which equation best describes the relationship between the number of hours spent shopping and the number of souvenirs bought?

- A $y = x + 2$
 B $y = 2x + 1$
 C $y = 3x$
 D $y = 4x - 1$

The table shows a set of values for x and y .

x	-5	-3	1	5
y	5	7	11	15

Which equation best represents this set of data?

- A $y = -x$
 B $y = x + 10$
 C $y = -2x - 5$
 D $y = -3x$

Which equation describes the data in the table?

x	y
-5	3
-2	6
1	9
4	12

- A $y = -x + 2$
 B $y = x + 8$
 C $y = -x - 2$
 D $y = -2x + 13$

Which set of coordinates *does not* describe a function?

- A $\{(2, -4), (-2, -7), (0, 2), (-3, 8)\}$
 B $\{(6, 2), (3, 5), (1, 10), (-1, 7)\}$
 C $\{(-6, -4), (-3, -3), (-2, -2), (6, -8)\}$
 D $\{(8, 4), (-8, -4), (2, 8), (2, 2)\}$

Which function includes all the ordered pairs in the table?

x	-1	0	1	2	3
y	4	0	4	16	36

- A $y = x^2 + 3$
 B $y = 4x^2$
 C $y = -4x^2$
 D $y = 2x^2 + 2$

Which set of coordinates describes a function?

- A $\{(2, -4), (-2, -5), (2, 3), (-2, 6)\}$
 B $\{(5, 2), (3, 2), (-1, 2), (-1, 4)\}$
 C $\{(-6, -4), (-4, -3), (-2, -5), (-6, -6)\}$
 D $\{(3, 2), (-3, -2), (5, 6), (8, 2)\}$

The chart shows the prices of a corsage with different numbers of flowers.

Corsage Prices

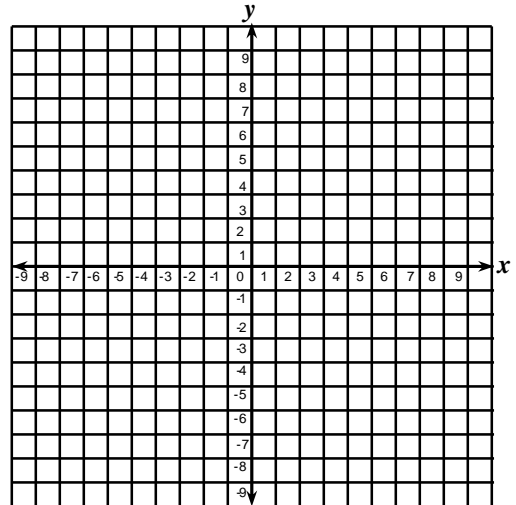
Number of Flowers, f	Total Price, P
1	\$5.50
2	\$7.00
3	\$8.50
4	\$10.00

Which equation shows the relationship between the total price, P , and the number of flowers, f ?

- A $P = 4f + 1.50$
 B $P = 1.50f + 4$
 C $P = f(3 + 2.50)$
 D $P = 2.50(f + 3)$

Which function includes all of the ordered pairs in the table?

x	-1	0	1	2	3
y	7	3	-1	-5	-9



- A $y = x + 8$
 B $y = -2x + 5$
 C $y = -3x + 4$
 D $y = -4x + 3$

Which function includes all of the ordered pairs in the table?

x	-1	0	1	2
y	-8	-4	0	4

- A $y = 3x - 5$
 B $y = x - 7$
 C $y = 4x - 4$
 D $y = -x + 9$

If $f = \{(2, 5), (-3, 6), (4, -2), (a, b)\}$ is a function. Which of the following could be (a, b) ?

- A (3, 4)
- B (2, -1)
- C (-3, -1)
- D (4, 6)

The chart shows the prices of a large pizza with different numbers of toppings.

Pizza Prices

Number of Toppings, t	Total Price, P
1	\$7.50
2	\$9.00
3	\$10.50
4	\$12.00

Which equation shows the relationship between the total price, P , and the number toppings, t ?

- A $P = 4t + 3.50$
- B $P = 3.50t + 4$
- C $P = t(6 + 1.50)$
- D $P = 1.50t + 6$

The length and perimeter of a rectangle with width 10 is shown below.

Perimeter	Length
22	1
24	2
30	5
40	10

Which equation shows the relationship between the perimeter, P , and the length, l ?

- A $P = 4l + 18$
- B $P = 10l + 12$
- C $P = l(20 + 2)$
- D $P = 2l + 20$

Which equation best describes the relationship between x and y shown in the table below?

x	y
-1	2
0	0
1	2
2	8

- A $y = x^2 + 2$
- B $y = x^2 + 1$
- C $y = x^2 - 1$
- D $y = 2x^2$