Georgia Milestones Assessment System

Algebra 1 Formula Sheet

Below are the formulas you may find useful as you work the problems. However, some of the formulas may not be used. You may refer to this page as you take the test.

Linear Formulas

Slope Formula

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

Linear Equations

Slope-intercept Form: $y = mx + b$

Point-slope Form: $y - y_1 = m(x - x_1)$

Standard Form: $Ax + By = C$

Arithmetic Sequence Formulas

Recursive: $a_n = a_{n-1} + d$

Explicit: $a_n = a_1 + (n-1)d$

Exponential Formulas

Exponential Equation

$y = ab^x$

Geometric Sequence Formulas

Recursive: $a_n = r(a_{n-1})$

Explicit: $a_n = a_1 \cdot r^{n-1}$

Compound Interest Formula

$$A = P\left(1 + \frac{r}{n}\right)^{nt}$$

Quadratic Formulas

Quadratic Equations

Standard Form: $y = ax^2 + bx + c$

Vertex Form: $y = a(x-h)^2 + k$

Quadratic Formula

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Average Rate of Change

The change in the y-value divided by the change in the x-value for two distinct points on a graph.

Statistics Formulas

Mean

$$\bar{x} = \frac{x_1 + x_2 + x_3 + \ldots + x_n}{n}$$

Interquartile Range

$IR = Q_3 - Q_1$

The difference between the first quartile and third quartile of a set of data.

Mean Absolute Deviation

$$\frac{\sum_{i=1}^{n} |x_i - \bar{x}|}{n}$$

The sum of the distances between each data value and the mean, divided by the number of data values.

Item 1

Which set of data points could be modeled by a decreasing linear function?

A. {(0, 0), (1, 8), (2, 15), (3, 22), (4, 30)}
B. {(0, 5), (1, 6), (2, 10), (3, 16), (4, 28)}
C. {(0, 50), (1, 42), (2, 33), (3, 25), (4, 16)}
D. {(0, 64), (1, 60), (2, 52), (3, 39), (4, 22)}

Item 2

Use these functions to answer this question.

$$P(x) = x^2 - x - 6$$

$$Q(x) = x - 3$$

What is $P(x) - Q(x)$?

A. $x^2 - 3$
B. $x^2 - 9$
C. $x^2 - 2x - 3$
D. $x^2 - 2x - 9$

Item 3

The total daily expenses to operate Sheila's pie bakery are the cost of salaries and ingredients. Sheila has four employees, and she pays each worker a daily rate. On average, it costs the same amount of money to make each pie. This expression shows the total daily expenses for Sheila's bakery to make x pies.

$$4(75) + \$0.50x$$

What does the term 4(75) represent?

A. The amount of money Sheila must pay her employees per day.
B. The number of pies Sheila must sell per day.
C. The total cost of expenses per pie.
D. The amount of money customers pay per pie.

Item 4

Which function represents the data in the table?

x	3	6	10	15
y	2.5	4	6	8.5

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

B. $f(x) = \frac{x}{2} - 1$

C. $f(x) = 2x - 1$

D. $f(x) = \frac{x}{2} + 1$

Item 5

What is the solution to this system of equations?

$$x - 3y = 1$$

$$x - 2y = 6$$

A. (−4, −5)
B. (−2, −1)
C. (4, 1)
D. (16, 5)

Item 6

Information about the costs of three catering companies is shown in this table.

Catering Company Costs

Acme Catering Company	Best Foods Company	Creative Catering Company
$6 per person plus a flat $100 time and equipment charge	$8 per person plus a flat $40 time and equipment charge	$10 per person charge with no other fees

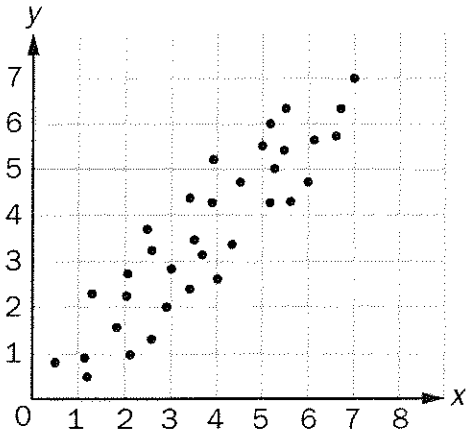
Gavin can spend no more than $300 on catering. What is the greatest number of people he can invite using one of the three caterers?

A. 30
B. 32
C. 33
D. 37

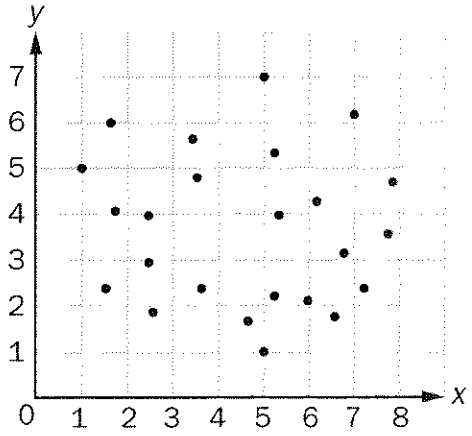
Item 7

Which set of data could be BEST modeled by a quadratic function?

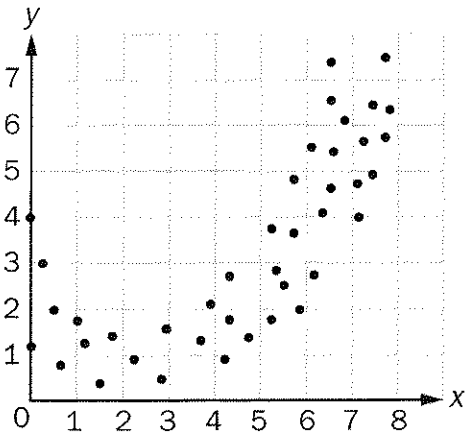
A.



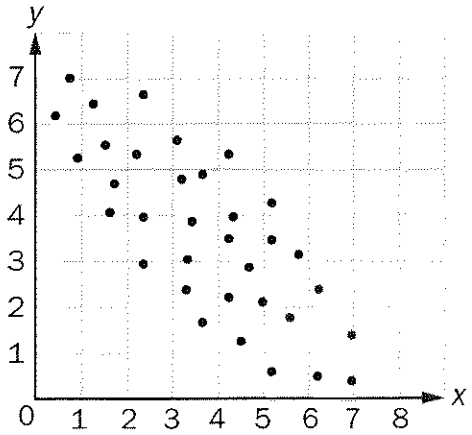
B.



C.



D.

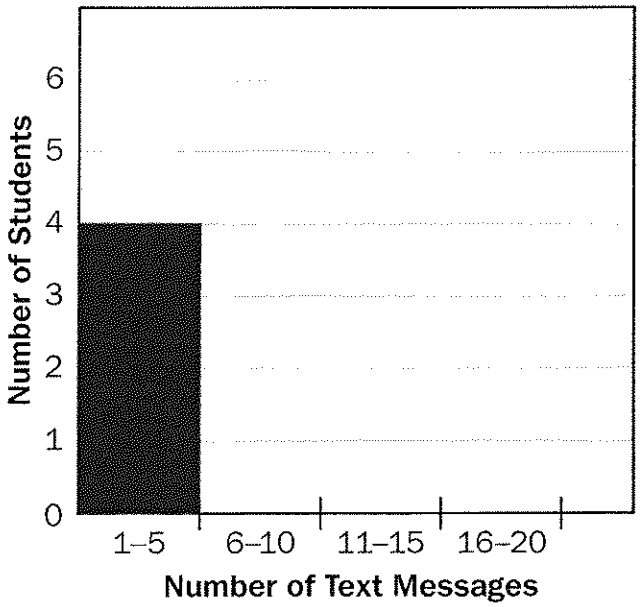


Item 8

This list shows the number of text messages each student in a group sent in one day.

16, 2, 8, 5, 3, 20,
15, 4, 9, 16, 19, 17

The students are creating this histogram to show their data.



What should be the height of the bar for 6–10 text messages?

A. 1
B. 2
C. 4
D. 5

Item 9

Jill solved the inequality $-\frac{x}{4} < \frac{x+2}{3}$ for x.

Her solution is shown.

Step 1: $-3x < 4x + 8$

Step 2: $-3x - 4x < 8$

Step 3: $-7x < 8$

Step 4: $x < -\frac{8}{7}$

Part A: Explain the mistake Jill made when solving for x. Write your answer on the lines provided.

Part B: Solve the inequality $-\frac{x}{4} < \frac{x+2}{3}$ for x. Show or explain how you found your answer. Write your answer on the lines provided.

Item 10

The student council makes an initial investment in a savings account that earns interest. The value of the savings account after m months is determined by the function $v(m) = 2{,}000(1.005)^m$. The student council also has a checking account which has a value after m months that is determined by the function $c(m) = 250 + 100m$.

Part A: What is the initial investment in the savings account?

Part B: What is the interest rate of the savings account?

When the student council has $2,450 in its checking account, it will purchase new computers for the library.

Part C: After how many months will the student council purchase new computers for the library?

Part D: How much money will be in the student council's savings account when they purchase the new computers? Explain your reasoning. Write your answer on the lines provided.