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

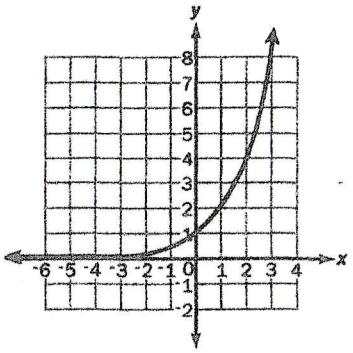
$$\frac{\sum_{i=1}^{n} |x_i - \bar{x}|}{n}$$

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

1. Which of these is NOT a function?

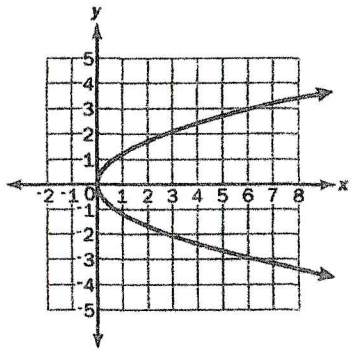
A. (5, 3), (6, 4), (7, 3), (8, 4)

B.

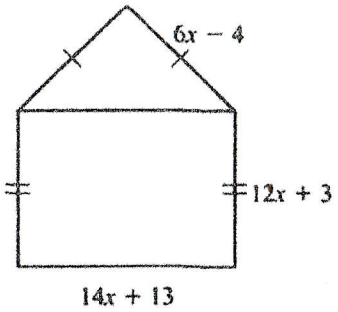


C. $y = 3x^2$

D.



2. A model of a house is shown.



What is the perimeter, in units, of the model?

A. $32x + 12$ units
B. $46x + 25$ units
C. $50x + 11$ units
D. $64x + 24$ units

3. Which statement BEST describes how the graph of $g(x) = -3x^2$ compares to the graph of $f(x) = x^2$?

A. The graph of $g(x)$ is a vertical stretch of $f(x)$ by a factor of 3.
B. The graph of $g(x)$ is a reflection of $f(x)$ across the x-axis.
C. The graph of $g(x)$ is a vertical shrink of $f(x)$ by a factor of $\frac{1}{3}$ and a reflection across the x-axis.
D. The graph of $g(x)$ is a vertical stretch of $f(x)$ by a factor of 3 and a reflection across the x-axis.

4. A wild horse runs at a rate of 8 miles an hour for 6 hours. Let y be the distance, in miles, the horse travels for a given amount of time, x, in hours. This situation can be modeled by a function.

Which of these describes the domain of the function?

A. $0 \leq x \leq 6$
B. $0 \leq y \leq 6$
C. $0 \leq x \leq 48$
D. $0 \leq y \leq 48$

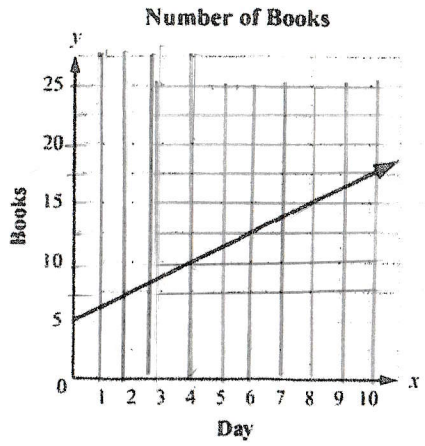
5. Sandra sells necklaces at a school craft fair. She uses the equation $P = 7.5n - (2.25n + 15)$ to determine her total profit at the fair. Based on this equation, how much does she charge for each necklace?

A. $2.25
B. $7.50
C. $15.00
D. $17.25

6. A shop sells one-pound bags of peanuts for $2 and three-pound bags of peanuts for $5. If 9 bags are purchased for a total cost of $36, how many three-pound bags were purchased?

A. 3
B. 6
C. 9
D. 18

(7) Juan and Patti decided to see who could read more books in a month. They began to keep track after Patti had already read 5 books that month. This graph shows the number of books Patti read for the next 10 days and the rate at which she will read for the rest of the month.



If Juan does not read any books before day 4 and he starts reading at the same rate as Patti for the rest of the month, how many books will he have read by day 12?

A. 5
B. 10
C. 15
D. 20

(8) A sample of 1,000 bacteria becomes infected with a virus. Each day, one-fourth of the bacteria sample dies due to the virus. A biologist studying the bacteria models the population of the bacteria with the function $P(t) = 1{,}000(0.75)^t$, where t is the time, in days.

What is the range of this function in this context?

A. any real number such that $t \geq 0$
B. any whole number such that $t \geq 0$
C. any real number such that $0 \leq P(t) \leq 1{,}000$
D. any whole number such that $0 \leq P(t) \leq 1{,}000$

(9) What is the vertex of the graph of $f(x) = x^2 + 10x - 9$?

A. (5, 66)
B. (5, –9)
C. (–5, –9)
D. (–5, –34)

(10) Which ordered pair is a solution of $3y + 2 = 2x - 5$?

A. (–5, 2)
B. (0, –5)
C. (5, 1)
D. (7, 5)