

Sample Algebra & Functions

This is a test of your ability to solve problems using Algebra.

1. Consider the following formula: $A = B + 3(4 - C)$

If B equals 5 & C equals 2, what is the value of A?

- A. 7
- B. 11
- C. 12
- D. 17

2. Consider the following formula: $Y = 3(x + 5)(x - 2)$

Which of the following formulas is equivalent to this one?

- A. $Y = 3x^2 + 9x - 30$
- B. $Y = x^2 + 3x - 10$
- C. $Y = 3x^2 + 3x - 10$
- D. $Y = 3x^2 + 3x - 30$

3. Consider the following pattern of numbers: **110, 112, 107, 109, 104**

What is the next number in the pattern?

- A. 97
- B. 99
- C. 106
- D. 109

4. Consider the following formula: $A = \frac{1}{2}b - 4$

Which of the following statements is true for this formula?

- A. When the value of b is less than 8, a is negative.
- B. When the value of b is greater than 8, a is negative.
- C. When the value of b is less than 8, a is positive.
- D. When the value of b is greater than 4, a is positive.

5. Consider the following table:

X	Y
0	-5
1	-4
2	-3
3	-2
4	-1
5	0
6	1

Which of the following choices represents the same relationship as demonstrated in this table?

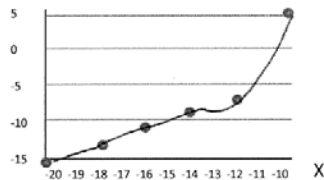
A.

X	Y
10	-40
20	-30
30	-20
40	-10

B. $Y = \frac{X}{2} - 5$

C. Y is equivalent to the difference between the value of X and a constant C, where C equals 5.

D.



6. Work with positive & negative real number, and the order of operations:

Simplify: $-5 + (-4)(-3) - 3^2$

7. Simplify expressions:
- A. $3(2x^2 - 3xy + y) - (y - x^2 + 2xy)$
- B. $\frac{12a^5b^{-2}}{8a^{-3}b^7}$
8. Expand and collect like terms:
- A. $(3x - 5)(6x + 7)$
- B. $(2x - 3)^2$
9. Factor:
- A. $x^2 - 5x - 14$
- B. $6a^2b^3 - 3a^2b$
10. Solve for X:
- A. $3x - (x + 4) - 5 = 5(x - 4) - 4$
- B. $3x - 5y + 6 = 0$
- C. $x^2 - 5x - 14 = 0$
11. Evaluate expression:
If $x = -3$, evaluate $x^2 - 2x - 1$
12. Find the equation of the line passing through 2 given points:
(2, -1) (-1, 7)
13. Solve a system of equations by ALL the following methods: substitution, elimination by addition (linear combinations), and graphically:
Given: $\begin{cases} 2x + y = -3 \\ 3x + 4y = -2 \end{cases}$
14. Solve a first-degree inequality in one variable:
Given: $8 - 5x + 9$ Solve for X

Sample Reading Comprehension

This test measures your ability to obtain information from written passages. You will be presented with a passage followed by a number of questions about it. A sample passage is shown below followed by three sample questions. This passage is shorter than those on the actual test.

Passage

The timing of New Year's Day has changed with customs and calendars. The Mayan civilization, on what is now called the Yucatan Peninsula of Mexico, celebrated the New Year on one of the two days when the noonday sun is directly overhead. In the equatorial regions of the Earth, between the Tropics of Cancer and Capricorn, the sun is in this position twice a year, once on its passage southward, and once on its passage northward. At the early Mayan city of Izapa in the southern Yucatan, the overhead date for the sun on its southward passage was August 13. The Mayans celebrated this as the date for the beginning of the year. Later, at the more northerly Mayan site of Edzna, the corresponding overhead date is July 26. Analyses of Maya pictorial calendars indicate that they celebrated the New Year on August 13 prior to 150 A.D., and on July 26 after that year. This change has been explained by archaeological dating showing that 150 A.D. was the time that the Mayans moved the hub of their civilization from the southern to the northern site.

- According to the passage, the sun at Edzna was directly overhead at noon on:**
 - July 26 only
 - August 13 only
 - July 26 and one other date
 - August 13 and one other date
- If the Mayans had moved their civilization's center south of Izapa, their new date for celebration of New Year would probably have been closest to which of the following dates?**
 - January 1
 - February 20
 - March 25
 - September 15
- Why did the Mayans move their capital city from Izapa to Edzna?**
 - The climate at Edzna was more temperate.
 - Lunar eclipses were more visible at Edzna.
 - The terrain near Edzna was more suitable for agriculture.
 - The Mayan city of Izapa was abandoned in 150 A.D.

Answer Key

Algebra and Functions

1. B
2. A
3. C
4. A
5. C
6. -2
7. a) $7x^2 - 11xy + 2y$
b) $\frac{3a^8}{2b^9}$
8. a) $18x^2 - 9x - 35$
b) $4x^2 - 12x - 9$
9. a) $(x - 7)(x + 2)$
b) $3a^2b(2b^2 - 1)$
10. a) $x = 5$
b) $x = \frac{5y - 6}{3}$
c) $x = 7, x = -2$
11. 14
12. $y = 2x - 5$
13. $x = -2, y = 1$
14. $x \leq -\frac{1}{8}$ OR $-\frac{1}{8} \geq x$

Reading Comprehension

1. C
2. D
3. D