

Algebra I Team Solutions - 2007

Question 1

If $x * y = xy$ and $x \# y = x - y$, then find $[2*(8\#12)]\#[(3*2)\#5]$

ANSWER: -9

Question 2

Find the sum of the reciprocals of all the factors of 30.

ANSWER: $\frac{12}{5}$

Question 3

Solve each of these equations and then evaluate $(ab)^{c-d}$

$$-3a + 4 = 8a - 2$$

$$\frac{1}{3}b - 3 = \frac{3}{4} + 2b$$

$$4(2c - 1) = 3(3 - 2c)$$

$$\frac{1}{1-d} = 14$$

ANSWER: 1

Question 4

Evaluate $(1,000,000,000,001)^2 - (999,999,999,999)^2$

ANSWER: 4,000,000,000,000

Question 5

Find the value of n if the average of $3n$, $\frac{1}{4}$, $\frac{7}{8}$, and 6 is n .

ANSWER: $\frac{57}{8}$

Question 6

The perimeter of a square is 96.

A) How long is each side of the square?

B) What is the area of the square?

ANSWER: 24,576

Question 7

Simplify $2 \left[\frac{5 - 2 * 2 + 8 * 3}{24 \div 6 + 4 - 3} \right]$

ANSWER: 10

Question 8

Solve for x: $-2 + |2x| = -6$

ANSWER: \emptyset

Question 9

If you buy peaches at 3 for 50 cents and sell them at 5 for \$1, how many must you sell to make a profit of \$10?

ANSWER: 300

Question 10

A) If $7 + 4 \div 2 > 8$, then $A=5$, if not then $A=3$

B) If $a + b = b + a$ is an example of the symmetric property of equality, then $B=8$, if not the $B=2$

C) If subtraction is commutative then $C=6$, if not then $c=5$

WHAT IS $A + BC$?

ANSWER: 15

Question 11

Solve each equation for x:

$$3x - 8 = -6x + 1$$

$$2(x + 3) = -4x + 3$$

$$-2 + 2(x - 1) = 3(2x + 4)$$

$$3x + 4(3x - 7) = 5 - 3(x - 1)$$

Find the average of these four solutions.

ANSWER: $\frac{-3}{8}$

Question 12

Let A = the slope of $3x + 2y = 9$

Let B = the y-intercept of $5x - 3y = 9$

Let C = the x-intercept of $4x - y = -10$

Find the value of $\frac{4A + B}{C}$

ANSWER: $\frac{18}{5}$

Question 13

Evaluate the expression for $x = -2$

$$\frac{3x^2 - 10x - 8}{2x + 2} \cdot \frac{x^2 + 5x + 4}{x^2 - 16}$$

ANSWER: -2

Question 14

Find the sum of $3\left(\frac{-1}{3}\right)^0 + 3\left(\frac{-1}{3}\right)^1 + 3\left(\frac{-1}{3}\right)^2 + 3\left(\frac{-1}{3}\right)^3 + 3\left(\frac{-1}{3}\right)^4$

Express your answer as a mixed number in simplified form.

ANSWER: $2\frac{7}{27}$

Question 15

The side of a square is 8. If the perimeter of the square is increased by 8, by how much does the area increase?

ANSWER: 36