

ALGEBRA 1 TEAM

QUESTION # 1

If the ratio of women to men in the county's ecology club is 3 to 2, and the club has 84 women members, how many men are members of the club?

QUESTION # 2

If  $a = \frac{3}{4}b$ ,  $b = \frac{2}{3}c$ ,  $c = \frac{6}{5}d$ , and  $d = 6$ , then find:

$$a^2 + b^2 + c^2 + d^2$$

QUESTION # 3

Mary bought a dress that had been marked down 25% off of the designer's suggested selling price and then marked down 20% from that sale price. Her friend Suzan bought the same dress she found in a store that had marked it down 30% off of the designer's suggested selling price and then marked it 15% down from their sale price. What is the difference in the percent of savings between the girls, and which girl saved the most off the original designer's suggested selling price?

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QUESTION # 4

Refer to the following definition:

For all a, b, c, and d such that  $ac \neq bd$

$$\frac{\begin{array}{c|c} a & b \\ \hline c & d \end{array}}{\quad} = \frac{ab - cd}{ac - bd}$$

Evaluate:

$$\frac{\begin{array}{c|c} 11 & 11 \\ \hline 11 & 9 \end{array}}{\quad} = \frac{11}{9}$$

QUESTION # 5

Factor completely:

$$4x^2 + 6xy + 2y^2$$

QUESTION # 6

$$A = \sqrt{20} + \sqrt{5} [20 - 4(8 + 10)]$$

$$B = 23 - 17 - \sqrt{150} - 6$$

$$C = [(7 + 16)(8 + 2)] - 3$$

Find the value of  $9B + AC$

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QUESTION # 7

Evaluate:

$$\frac{(2^{12})x^{16}y^7z^{15}}{(3^6)x^{12}y^5z^{15}} + (x^2)^2(y^3)^4(z^5)^3$$

QUESTION # 8

If  $m$  and  $n$  are both positive, and  $m^2 + n^2 = 100$ , and  $m^2 - n^2 = 28$ , then find the difference between the LCM (least common multiple) and the GCF (greatest common factor) of  $m$  and  $n$ .

QUESTION # 9

The operation  $\otimes$  is defined by the equation:

$$x \otimes y = x^2 - y^2$$

$$\text{and } xy \neq 0$$

Evaluate:

$$(8 \otimes 9) + (12 \otimes 4) - (6 \otimes 7) + (10 \otimes 12)$$

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QUESTION # 10

a .....	\$ 15.00
b.....	\$ 25.00
c.....	\$ 10.00
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Subtotal..	\$ 50.00
Tax.....	\$ .80
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Total..	\$ 50.80

On the receipt above only item b was taxed. What is the tax rate (percent)?

QUESTION # 11

Solve for x:

$$\left(x + \frac{3}{2}\right) + \left(x - \frac{3}{2}\right) + \left(x + \frac{2}{3}\right) = 12$$

QUESTION # 12

Alex can mow a certain size lawn in A hours. Joe can mow the same size lawn in one-half the time that it takes Alex. Jane can mow that same size lawn in two-thirds the time that it takes Alex. In terms of A, how long would it take them to mow the lawn if they work together?

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QUESTION # 13

A certain recipe that serves six (6) people requires  $\frac{3}{8}$  teaspoon of vanilla extract. If the recipe is increased proportionally for the number of people served, how much vanilla extract would be required to make enough to serve nine (9) people?

QUESTION # 14

If  $n!$  is equal to  $\frac{n!}{x}$  (ex:  $5! = \frac{5!}{5}$ , and  $5! = 5 \times 4 \times 3 \times 2 \times 1 = 120$ )

Evaluate:

$$\frac{6! - 3!}{(3! + 3!)}$$

QUESTION # 15

Candy rows her boat 28 miles in still water at a rate of 8 miles per hour. On her way back the dam's flood gates are opened creating a current of 3 miles per hour she must row against to get home. What is the total time both going and coming Candy will spend traveling?