

1) Three different pizza companies competed to get the school's cafeteria business. Each had a different price plan and your job is to pick the one that would be the best value for the school and tell the price. The best value is defined as getting the most pizza per square inch. Company A has a pizza that is 14 inches in diameter with a price of \$ 12. Company B is offering a pizza with a diameter of 15 inches for \$ 14. Company C is offering two 9 inch diameter pizzas for \$ 10. Which company is offering the best value and what is the value per square inch? Round answer to the nearest thousandths place.

2) Find the sum of the mean, the median, and the mode for the following set of numbers.

{ 12, 15, 18, 12, 19, 22, 18, 12, 28, 32, 42, 32, 12, 34, 34, 82, 66, 2001 }

3) Simplify the following expression in the lowest terms possible:

$$-2R\{-4(3-6\{-7+11(6-13\{5-3\}-4\{-6-4\})-6\})-3\}$$

4) Find $X + Y$ for the following system of equations with the given information:

$$X = 4B - 2A$$

$$Y = 5(6 - 9)(3 - F) - 3B$$

$$B = 2A - 4C$$

$$F = 16(4 + G)$$

$$C = -32 + 2D$$

$$G = -|9 - 13| + H$$

$$D = 32 + C$$

$$H = 2001(2002) - (2002)2001$$

5) In football, a touchdown is worth six points, a fieldgoal is worth three points, a safety is worth 2 points, and an extra point is worth only one point. If an excellent team, such as the Dolphins, were to score 36 points with exactly 2 of them being scored as extra points, then list all of the different point combinations. The number of safety's are to be equal to or less than the number of touchdown's. (Note: The answer(s) needs to be given as an ordered quadruple(s): (touchdown(s), fieldgoal(s), safety(s), extra point(s)).

6) Imagine if you will, a right triangle. Isn't it a beautiful thing, 3 perfectly straight line segments, one absolutely awesome ninety degree angle and two cute little acute angles. We know that this triangle is not an isosceles triangle. The absolute value for the difference between the smallest side and the hypotenuse is a perfect square. The sum of all three sides are less than eight squared. The sum of the cubes of the two legs is greater than 3000 and less than 10,000. If the triangle is a Pythagorean Triple then find the area of this right triangle.

7) x , y , and z are all natural numbers. $x > y > z$, x is between 12 and 45 and is a prime number, y is the sum of the positive integral factors of twenty, z is the absolute value of the number needed to make $(2001 - 1991)$ equal to zero. Find the sum of the squares of x , y , and z .

8) Assume no variables are equal to zero. Simplify:

$$\frac{15x^2z^4}{16y^3z^2} \cdot \frac{x^3 + 28x^2 - (7x)(4x)}{5x^5 - 5x^3} \div \frac{3x^2z^2 - 3xyz^2 + 3y^2z^2}{8x^2 - 8}$$

9) Two lines A and B are parallel and they cross the y axis at 3 and 5 respectively. Find the equation for the line parallel to A that crosses the x axis at 8 and is perpendicular to the line $4x - 3y = 9$. You must write your answer in standard form.

10) A new building is to be designed so that the width of its rectangular floor is three-fourths its length in feet. In addition, the new building will eventually be enlarged later, increasing its length by twenty feet and its width by ten feet, ultimately doubling the floor area. Find the cost to carpet the original area if the cost of the carpet is \$ 10.25 per square yard. Round the answer to the nearest cent.

11) Find the sum of the value(s) for x which make the following equation true:

$$\frac{x^2 - 8x - 33}{x^2 - 9} = 4$$

12) Assume no variables are equal to zero. Simplify using positive exponents:

$$\left(\frac{\frac{3xy^{-4}z^3}{2y^3z^{-5}}}{\frac{6x^3yz^{-6}}{9x^{-3}y^3z^{-4}}} \right)^{-3}$$

13) Find the simplest form for the following expression for all values of x which the expression is defined.

$$\frac{x^2 + 3x + 2}{x^2 - x - 2} \cdot \frac{x^3 - 25x}{x^2 - 2x - 35} \cdot \frac{x^2 - 9x + 14}{x^2 - 5x}$$

14) Four different colored marbles are all in a bag. On a single pull from the bag the probability of getting a Green marble is 3 out of 8. On a single pull from the bag the probability of getting a Red marble is 1 out of 3. On a single pull from the bag the probability of getting a Blue marble is 1 out of 12. The total number of marbles in the bag is equal to the least common denominator for the above three denominators of the probabilities. Find the total number of Yellow marbles in the bag. Yellow is one of the four colors in the bag, the others are Red, Blue, and Green.

15) Expand the following and Simplify: Answer must be expressed in ascending order with respect to x .

$$(5x + 15)(x^5 + 4x^4 - 5x - 7)(5x - 15)$$