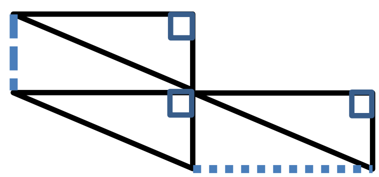
Team Ciphering 7th Grade Round 2

	ANSWERS
1. Let x = $\sqrt{2+\sqrt{2+\sqrt{2+\cdots}}}$ Let y = $2+\dfrac{2}{2+\frac{2}{2+\frac{2}{1}}}$ Let z = $(2+3)^{(5-3)}$ Find the value of $\dfrac{x^2}{yz}$.	
2. Let A = $8+6+\frac{9}{2}+\frac{27}{8}+\cdots$ B = $\frac{9}{10}+\frac{9}{100}+\frac{9}{1000}+\cdots$ C = the sum of the integral factors of 31415 Find $\left(\frac{A}{B}\right)^C$	
3. If a% of b is 9, b% of c is 60, and 15% of 80 is a, find c% of a.	
4. Solve each equation. (1) 3a – 7 = 8 + 6a + 12 (2) 8b + 32 = 65 + 5b (3) 13c + 19 = 68 + 6c (4) 8d – 2(d +5) = 2d - 2 Find the value of $\dfrac{ac}{b-d}$.	
5. Lily goes to Berry Middle School and loves math team! If A = the number of vowels in the above sentence and B = the number of consonants in the sentence, What is $\frac{A+B}{A-B}$?	

Team Ciphering	7^{th} Grade	Round 1

1. The Boyer family has 8 children: Nancy, Susan, Carol, Freddy, Laura, Bobby, Merry and Paul. Any of the older seven children can clean the entire house in 12 hours, while Paul can totally mess it up in only 3 hours. If all children are “working” together, how long will it take to clean the house?	ANSWERS
2. The Avondale library contains between 2500 and 3500 books. One-eleventh of them are math books, 1/19 of them are science books, and 20% are novels. How many books does the library have?	
3. Let A = complement of 32^{o} Let B = supplement of 64^{o}. Let C = measure of an interior angle of a regular hexagon. Find $\frac{C}{A+2} \times \frac{A}{B}$	
4. • Let A be the number of positive values of n that will make $\frac{48}{n+5}$ a whole number. • Let B = the number of distinct prime factors of 2750. • Let C = the number of distinct 5-digit numbers in base 2. Find the value of $\frac{AC}{B}$.	
5. If: 3a + 2b + 9c – 5d = 32 32(a + b + c) + d = 132 5a + 6b - c + 4d = 32 What is a + b + c ?	

Team Ciphering 7th Grade Round 3

1. Consider the number 255. • A = the number of proper factors, including 1. • B = sum of distinct prime factors • C = sum of the exponents of the prime factorization Find (C + B)/A	ANSWERS
2. How many different positive three-digit numbers can be made using any three of the following digits: 2, 3, 3, 5, 5?	
3. If the dashed line is 8 cm in length, and the dotted line is 12 cm in length, find the total area of the 3 congruent right triangles. 	
4. Let Q = sum of the numerator and denominator of $^{2}/_{11} + ^{5}/_{11}$. Let W = sum of the prime factors of 600 Let E = 80% of 200. Let R = the sum of prime numbers between 10 and 30. Let T = $\frac{3!5!}{4!}$ Find Q + W + E + R + T	
5. Find the sum of the measures of each of the angles described below: • The smaller angle formed by the minute and hour hand of a clock at 4:30. • The sum of the interior angles in a pentagon • The vertex angle of an isosceles triangle with base angles of 30^{o}.	

Team Ciphering 7th Grade Round 4

1. Let f be the fraction of the LCM (12, 24) that is the GCF (12, 24). Let u be $g(f(2))$, if $f(x) = 2x - 1$ and $g(x) = x^2$. Let n be 2ab if GCF(a,b) = 5 and LCM(a,b) = 175. Find *fun*.	ANSWERS
2. Simplify and place in A: $4(\sqrt[3]{125})\ (2(\sqrt[3]{27}))$ The area of a circle inscribed in a square is 16π. Let B = area of the square. A triangle has angles in the ratio of 2:3:4. Find the complement of the smallest angle; call it C. Find A + B - C.	
3. • Let A = the area of a square with side length of 10. • Let B = the area of a square formed by joining the midpoints of the above square. • Let C = the area of a circle circumscribed about the square in A. • Let D = the area of a circle circumscribed about the square in B. Find C/D.	
4. Let w = $2012^2 - 2011^2$ Let a = $\frac{P\ (10,4)}{7!}$ Let l = the sum of the numerator and denominator of the slope of the line that passes through (3,5) and (2,7). Find w - a + l^2	
5. • In an arithmetic sequence, $t_4 = 16$ while $t_{12} = 152$. What is t_7? • Convert the binary number 1010011 to a decimal number. • What is the sum of the number of vertices, edges, and faces of a regular tetrahedron? • If the sides of a square of area 100 are increased by 40%, what is the area of the new square formed? Find the sum of all of these numbers.	