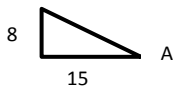
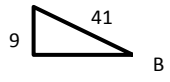
Team Ciphering 8th Grade Round 1

1. Solve each system of equations: (1) 4x + 3y = 7 -2x + y = 9 (2) a = - b - 4 4b – a = -1 Find the value of $\frac{xy}{a-b}$.	ANSWERS
2. Find the value of $\frac{B^2\sqrt{A^2+C^2}}{D}$ when • $2A = \sqrt{A+138}$ • $B = \sqrt{8} \cdot \frac{1}{4}\sqrt{6}$ • C is the positive solution of $C^2 + 6C - 112 = 0$ • $\sqrt{D+18} = \sqrt{7D}$	
3. (1) A is the value of the x-intercept of the line containing the point (7,10) and perpendicular to the line 2x + 4y = 10. (2) B is the value of the y-intercept of the line through the midpoint of the segment from (3,7) to (5,19) and containing the point (-2, -3). (3) C is the vertical distance between the lines 2x + 4y = 6 and 2x + 4y = 9. Find the value of BC – 4A.	
4. Let A = cos A for And D = sin A. Let B = tan B for Triangle 2 And C = cot B. Fin the value of $(A^2 + D^2)(BC)^3$ Triangle 1  Triangle 2  	
5. Let A = GCF(15,25) and B = LCM(15,25). If $\frac{AB}{B-A}$ is written in simplest form, find the sum of the numerator and denominator.	

Team Ciphering 8th Grade Round 2

1. Let line ℓ have the equation 2x – 3y = 9 while the equation of line m is 3x + y = 8. A = slope of line m. B = y-intercept of line ℓ C = the abscissa of the point of intersection of the lines D = the ordinate of the point of intersection of the lines. Find the value of [A – B(D + C)]	ANSWERS
2. The diameter of Sphere A is 12. The diameter of Sphere B is 50% of that of Sphere A. A = Volume of Sphere A B = Surface area of Sphere A C = Volume of Sphere B D = Surface area of Sphere B Find the value of the sum of A+B+C+D.	
3. A = $\binom{10}{0}+\binom{10}{1}+\binom{10}{2}+\ldots+\binom{10}{9}+\binom{10}{10}$ B = probability of flipping a coin 5 times and getting all heads C = number of distinct permutations of BERRY Find the value of $\frac{AB}{C}$.	
4. Let A = ratio of the area of a circle inscribed in a square to the area of the square itself. B = ratio of the circumference of the same circle to the perimeter of the same square. Find the value of A + B.	
5. There are 6 students on Simmons' Algebra Math Team. They never *ever* put their names on their papers. • They work in pairs. How many different pairs can be formed during the year? Let that value = C. • If Mrs. Clopton handed back a set of papers, what is the probability that exactly 5 will get the correct paper back? Let that value = A. • She can arrange them in lines ranked by height, either tall to small or small to tall. How many other ways can she arrange them in a line? Let that value = B. Find $\frac{A}{B+C}$	

Team Ciphering 8th Grade Round 3

1. Find A(C-B) if: • The area of a circle is Aπ while the area of its inscribed square is 36. • The area of an equilateral triangle of side length 6 is $B\sqrt{3}$. • C is the percent of the figure not shaded, to the nearest whole percent. 	ANSWERS
2. Let • A = the number of distinct arrangements of ILOVEMATH • B = the product of the integers in the interval [-100, 100]. • C = the sum (written in base 20) of the first 20 positive odd decimal integers Find (ABC).	
3. Let A = $\frac{\binom{8}{5}}{7}$ B = $\left(\sqrt[3]{A}+1\right)^3$ C = $\frac{A^3+\sqrt[3]{B}}{5}$ Find $\frac{B+C}{10}-A$.	
4. Let • A= the probability of getting a sum of 9 when rolling two standard 6-sided dice. • B = the probability of drawing a black card and then a diamond, with replacement. • C = the probability that a coin, flipped 5 times, will land tails one more times than heads. • D= the probability that in a bowl of 64 cubes (20 green, 19 red and the rest blue) you randomly draw a cube that is not green. • Find the value of $\frac{B\sqrt{A}}{C+D}$.	
5. • In many states license plates have 3 letters followed by 3 digits. If O and 0 cannot be used, let A be the number of such plates that begin with the letter A. • Let B = the base that has the value of 501 for 321_{10} . • Rachel ran 100 yards in 12 seconds. Find C, her rate in miles per hour to the nearest whole number. Find A /(B+C).	

Team Ciphering 8th Grade Round 4

	ANSWERS
1. Let A be the decimal value of $123_4 + 456_7$. Let B = the slope of the line perpendicular to $4x + 9y = 105$. Find the volume (written as $C\pi$) of a sphere whose great circle has a circumference of 18π. Find the sum of the numerator and denominator of B(A/C).	
2. Let A = the side length of the cube whose surface area is numerically equal to its volume. Let B = the radius length of the sphere whose volume is numerically equal to its surface area. Find A^B.	
3. Using the digits 2, 5, 7, and 9 once in each number, how many different four-digit numbers can be formed? Call this N. Find the sum of all the numbers formed above. Call this M. Find the value of M/N.	
4. Let B = sum of the integral factors of 255. Let E = number of distinct prime factors of 255. Let R = number of proper factors of 255, including 1. Let Y = median of the set of factors of 255. Find the value of $B + E + R^2 + Y$.	
5. Find the sum of all numbers less than 50 that have exactly 3 factors.	