Ciphering – 8th grade

- In the ciphering round, students will be given 90 seconds to answer each question. If the student solves the question within the first 30 seconds, their school receives 5 points; if they solve the question within 60 seconds, they receive 3 points; if they solve the question within 90 seconds, they receive 1 point. Runners will collect your papers during the 5 second warning. There is no penalty for a wrong answers. All fractions must be reported in their simplest forms or as a decimal, and *e, i,* or π must be left in the answer. You must write your answers in the box provided, or they will not be scored. Please remember to write your name and school name on your answer sheet before each round. I will give a 5 second warning before the end of each 30 second interval. Please raise your right hand up high with your answer sheet folded in half if you have the answer when I give the warning. It is NOT necessary to include units but if wrong units are provided, then the answer is wrong. No calculators or other aides are allowed. Any questions? This is a sample problem. And…begin.

Round # - Question #	Answer
Sample: Compute the value of x. $\sqrt{17 + 2^5} = x + 2$	5
1-1 Simplify in terms of a. $\frac{a\ (a^2 - 5a + 4)}{a(a-1)}$	$a - 4$
1-2 What is 25% of 40% of 460?	46
1-3 If I have a bag of 14 shapes, either heptagons or quadrilaterals, and there are a total of 83 sides, what is the positive difference of the number heptagons and the number of quadrilaterals?	4
1-4 What is the smallest positive integer that cannot be written as the sum of only 8s and 17s?	1
1-5 How many subsets of $\{2, 4, 6, 8, 10, \ldots\ 2n\}$ have at least one odd number?	0
2-1	

How many ways can you spell CORRECT ***incorrectly***?	1259
2-2 After subtracting 338 from $1/37$ of my friend's favorite number, I got the number 27. What is my friend's favorite number?	13505
2-3 What is the measure of the larger angle, in degrees, on a clock at the time of 8:20?	230°
2-4 If a right triangle has a hypotenuse of 61 and a leg of 11, what is the length of the other leg?	60
2-5 What is the sum of the product and sum of the roots of the equation $x^2 - 11x + 28$?	39
3-1 A bacteria culture doubles its population every 10 minutes. If its population started at 1, how long will it take, in minutes, for there to be 1024 bacteria in the dish?	100 minutes
3-2 Given that $i = \sqrt{-1}$, what is the value of $(((((i)^3)^5)^7)^9)^4$	1
3-3 What are the coordinates, in form (x, y), of the intersection of the lines $y - 1 = 2(x + 3)$ and $4x - 3y + 6 = 0$?	$(-7\frac{1}{2}, 8)$ $(-7.5, 8)$ $(\frac{-15}{2}, 8)$
3-4 What is the units digit of the sum $7^4 + 9^3 + 3^{13}$?	3
3-5 Don draws a card out a standard, 52-card deck. What is the probability that it is NOT a face card? Note that Ace is NOT a face card.	$\frac{10}{13}$
4-1 Lawrence and his friends went out to eat at a pizza restaurant. If the tip is 15% of the	$151.80

original bill and tax, at a rate of 10%, is applied after the tip, what was the total, in dollars, they paid for a bill of $120 dollars?	
4-2 If I have an equilateral triangle with area $4\sqrt{3}$ and a perimeter of $\frac{1}{3}x + 5$, what is the value of x^2?	441
4-3 Ian ran 3 meters east, $5\sqrt{2}$ northeast, and another 10 meters north. From there, he cuts across the open field straight home. How far, in meters, did Ian run across the open field?	17
4-4 If I have 6 identical pens to put into 3 identical containers, how many different ways can I do this if I have to put at least one pen in each container?	3
4-5 Your sock drawer is a mess. There are 4 green socks, 5 red socks, and 1 yellow sock. What is the probability that you grab a pair of green socks without looking? Express as a fraction.	2/15
Ext 1 Find the value of x in $4x + 2(3x - 4) = 2x + 2 - x - 3 + 5 - x - 4$	4/5
Ext 2 Two similar myriagons have perimeters of 18 and 27. What is the ratio of the area of the larger myriagon to the area of the smaller myriagon?	$\frac{9}{4}$
Ext 3 At an unnamed school, there are 210 students. Of those, 145 take Calculus and 137 take Sociology. If there are 13 who hate those subjects and don't take the classes, how many students take both subjects?	85

Notes*:

- 1st round isn't the easiest, but not the hardest
- 4th round isn't the hardest, but not the easiest
- It is not necessary to include units, but if the wrong unit is provided, it is wrong
- $ and ¢ signs will be specified in the question. Wrong units, wrong answer
    - Ex: Q needs $0.99, student answers 99¢ >> answer is incorrect

*I just wrote these in cause that what usually happens. $/¢ has happened before.