**CHILES MINI MU 2015**

**INTERSCHOOL TEST**

**INSTRUCTIONS**

1. This is a 30 minute, free response, group effort test.
2. All answers will be in one of the following forms: integer, fraction in simplest form, letter, or a single word.
3. There will be no irrational answers (no square roots, pi, e, etc.).
4. Scoring will be 1 point for correct answer, 0 points for a blank or skipped answer, and 5 points for the correct phrase at the end.
5. Teams will be made up of no more than 10 students and one sponsor or parent if no sponsor can be found.
   1. Schools may form more than one team. However, only the highest placing team from a school may receive a trophy.
   2. Students from different schools may form a mixed team as long as a parent or sponsor is available. This sponsor or parent will determine the school affiliation for placing purposes.
6. Students are not to use calculators, cell phones, or any other electronic device during the testing period. However, the parent or sponsor of each team may be permitted (and are encouraged) to use such a device. Some answers on this test may be found using tools such as Google, Wolfram Alpha, Wikipedia (beware!), and others. **Note:** Only sponsors may use the electronic device, and only students may write answers on the test paper. The sponsor's role here is not to do the test for the students, rather be a resource they may use to help them complete the test.
7. Students may communicate amongst their team members, but one should not do so too loudly; you never know what other teams might be listening to your answers.
8. Teams from the same school (as determined by Rule 2(b)), may not sit adjacent to each other.
9. Disputes will not be accepted.
10. You MUST have fun while taking this test.

Team Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

This will be used to differentiate teams from the same school. Make it unique, make it funny, but be warned: any offensive or vulgar team names will automatically disqualify that team.

**Trivia**

1. What is the circumference of the earth around the equator, in miles?
2. How many states in the US border an ocean?
3. Which NBA franchise was formed in 1948 and has the most all time wins?
4. In terms of numbers of volumes sold, what is the best-selling manga series in history?
5. Who authored The Scarlet Letter?
6. How many letters are in the Greek alphabet?
7. What famous movie director was born on the same day as this test’s author? He directed *Titanic*, *Avatar*, and *The* *Terminator*.
8. Which American Civil War battle had the most total casualties?
9. Which popular Cartoon Network series starred three heroines whose existence is owed to “Chemical X”?
10. How many Pokémon were in the first generation?
11. Which popular video game’s main antagonist is GLaDOS?
12. Which NFL quarterback currently on a roster has the most wins as a starter? Hint: He’s currently benched for a foot injury.
13. The actor who played “Q” in the recent Bond film Skyfall also starred in which movie alongside Tom Hanks and Halle Berry?
14. Which actor played Oliver Wood in the Harry Potter movies?
15. How many players may be on the field for each team in a standard game of tackle football?
16. In what year was Dr. Pepper first created?
17. Who was the mathematician who proposed the theorem abbreviated “FLT”?
18. Who was the man who coined the term “meme”?
19. On what day is pink worn, in the hit movie “Mean Girls”?
20. Which popular website was named after a large number?
21. With what studio is acclaimed director Hiyao Miyazaki affiliated?
22. What wacky white-and-red-wearing weirdo is the star of many a “find me in a crowd” puzzles?
23. What team was the most recent League of Legends World Champions?
24. This president of the US had a middle initial that was not actually short for a name.
25. What is the letter “K” in the standard NATO phonetic alphabet?

**MATH**

1. How many times does the number 4 appear in ?
2. What fraction of 315 is 35?
3. How many digits are in ?
4. What is ?
5. Simplify the fraction .
6. How many regular polygons will tessellate the plane with no gaps?
7. What is ?
8. What is the remainder when 479,001,600 is divided by 13?
9. How many diagonals are there in a regular 23-gon?
10. What is the sum of the roots of ?
11. What is the sum of the cubes of the first 5 prime numbers?
12. How many real roots exist for ?
13. How many students would need to be gathered in one room to guarantee that two of them share a birthday (ignore birth year)?
14. In one non-daylight savings year (365.0 days), how many times do the minute and hour hand pass the number 3 on a standard 12-hour clock?
15. What is the smallest positive value attainable by combining integer multiples of 12 and 27?
16. What is the volume of the cube circumscribes about a sphere with volume ?(ignore units)
17. How many real legs are there at a Pirate convention with 2500 attendees where exactly 20% of the attendees have one peg leg and 10% have two peg legs?
18. What is the largest number that is impossible to make with positive integer multiples of 3 and 17?
19. If I have 48 Twitter followers on day 0 and my total number of followers grows by 50% each day, on which day would I theoretically have a non-integer number of followers?
20. Express the number 521 in base 7.

**Logic**

1. Suppose four people are arrested for a crime, but there is not room in the jail for them. Their jailor decides to let them all go if they can solve a logic problem. He places one prisoner in a separate room and the other three in a line, all facing the same direction. The guard has two white hats and two black hats, which he gives to the prisoners randomly. A prisoner may only see the hats in front of him, not his own or behind him. No verbal or physical communication is allowed between the prisoners. The game is simple: if any prisoner can say with absolute certainty (NO GUESSING) what hat color they are wearing, the prisoners will go free. If both the prisoner in the separate room and the first prisoner in line are wearing black hats, which prisoner can perfectly deduce his own hat color, thus setting the prisoners free?
2. I have three black marbles and three white marbles. I place two black marbles into an urn, two white marbles into one urn, and the remaining black and white marbles into a third urn. I label all my urns correctly and then go take a nap. My esteemed colleague Nilay walks in while I am asleep and, up to no good as usual, switches all the labels so that no urn is labeled correctly now. I wake up to discover his mischief. What is the minimum number of marbles I must draw (one at a time) to discover which urn contains each pair of marbles?
3. Four people—A, B, C, and D—need to cross a bridge late at night. The bridge is unstable, and so only up to two people can cross at one time; also, a torch must be carried by at least one of those crossing the bridge each time. Unfortunately, they only have one torch between them (so at least one person has to go back each time two people cross to the other side). A takes 2 minutes to cross the bridge, B takes three minutes, C takes 7 minutes, and D takes 8 minutes. When two people cross, they cross at the rate of the slower person. What is the least amount of time, in minutes, it will take for everyone to get across?

**Special Phrase**

Decode the phrase for 5 bonus points!

[Trivia 2][# of letters in Trivia 4][Logic 2][2x Math 10] [SPACE] [9x Math 2][9x Math 1][# of letters in Trivia 22] [SPACE] [9 + Trivia 15][2x Math 3][5x Math 15][Logic 3][Math 19]!?

TEAM NAME : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**ANSWER SHEET**

Trivia

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7. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
8. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
9. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
10. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
11. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
12. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
13. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
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25. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Math

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
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20. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Logic

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2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Special Phrase

\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_!?