"Math is Cool" Championships – 2016-17

October 19, 2016

Total Correct: KEY

STUDENT NAME: _____ **School Name:** _____

Proctor Name: _____ Team #: _____ Room #: _____

High School Individual Contest – Score Sheet
DO NOT WRITE IN SHADED REGIONS

	Answer	1 or 0	1 or 0
1	11236		
2	3		
3	[x=] 7		
4	25 [%]		
5	2		
6	3		
7	13		
8	36 [sq cm]		
9	48 [ways]		
10	21 [instructors]		
11	52 [*units*]		
12	49		
13	26 [cm]		
14	92		
15	20 [vertices]		
1-15 TOTAL:			

	Answer	1 or 0	1 or 0
16	20		
17	6		
18	1		
19	3 [units]		
20	4		
21	2		
22	0		
23	5 [deg]		
24	12		
25	2 [times]		
26	6		
27	18 [squares]		
28	2		
29	3 [points]		
30	43		
16-30 TOTAL:			

	Answer	1 or 0	1 or 0
31	5 [primes]		
32	148		
33	44		
34	18 [days]		
35	0 [numbers]		
36	1 [solutions]		
37	84 [terms]		
38	4		
39	5 [units]		
40	29 [ordered pairs]		
31-40 TOTAL:			

Total Correct:

"Math is Cool" Championships – 2016-17

October 19, 2016

STUDENT NAME: _____ **School Name:** _____

Proctor Name: _____ Team #: _____ Room #: _____

High School Individual Contest – Score Sheet

DO NOT WRITE IN SHADED REGIONS

	Answer	1 or 0	1 or 0
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
1-15 TOTAL:			

	Answer	1 or 0	1 or 0
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
16-30 TOTAL:			

	Answer	1 or 0	1 or 0
31			
32			
33			
34			
35			
36			
37			
38			
39			
40			
31-40 TOTAL:			

"Math is Cool" Championships – 2016-17

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High School Mental Math Contest

Follow along as your proctor reads these instructions to you. Your Mental Math score sheet is on the back.

GENERAL INSTRUCTIONS applying to all tests:

- *Good sportsmanship is expected throughout the competition by <u>all</u> involved, both competitors and observers. Display of poor sportsmanship may result in disqualification.*
- *Calculators or any other aids may not be used on any portion of this contest.*
- *Unless stated otherwise, all rational, non-integer answers need to be expressed as reduced common fractions except in case of problems dealing with money. In the case of problems requiring dollar answers, answer as a decimal rounded to the nearest hundredth (ie, to the nearest cent).*
- *All radicals must be simplified and all denominators must be rationalized.*
- *Units are not necessary as part of your answer unless it is a problem that deals with time and in that case, a.m. or p.m. is required. However, if you choose to use units, they must be correct.*
- *Leave all answers in terms of π where applicable.*
- *Do not round any answers unless stated otherwise.*
- *Record all answers on the colored cover sheets in the answer column only.*
- *Make sure all answer sheets have all the information (name, team number, etc.) at the top of the sheet filled out.*
- *Tests will be scored as a 0 if answers are not recorded on the answer sheets.*
- *Blank answer sheets and answer sheets with no name will be scored as a 0.*

<u>Mental Math</u> – 30 sec per question

8 problems read orally to everyone - Approximately 8% of Individual Score - 25% of team score

When it is time to begin, the proctor will read the first question twice. You may not do any writing or talking while arriving at a solution. Once you have a solution, record it on the sheet in front of you. ***You may not change or cross out answers once you have written an answer down. If there are eraser marks, write-overs, or crossed-out answers, they will be marked wrong.*** *Once all students have laid their pencils on the desk, another question will be asked. If a student doesn't lay his/her pencil down, the maximum wait time is 30 seconds after completion of the second reading of the question before another question is asked. You may continue to work on a problem while the next question is being read. The value of each question is a one or zero. Each student will be asked the same eight questions. Individual scores used to determine individual placing will be determined by the sum of the Mental Math score and the Individual Test score for each individual. In addition, the top three Mental Math scores from one team will be totaled and doubled and will contribute to 25% of the team score.*

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High School – October 19, 2016

Mental Math Contest

Mental Math – 30 sec per question

8 problems read orally to everyone - Approximately 8% of Individual Score - 25% of team score

When it is time to begin, the proctor will read the first question twice. You may not do any writing or talking while arriving at a solution. Once you have a solution, record it on the sheet in front of you. ***You may not change or cross out answers once you have written an answer down. If there are eraser marks, write-overs, or crossed-out answers, they will be marked wrong.*** *Once all students have laid their pencils on the desk, another question will be asked. If a student doesn't lay his/her pencil down, the maximum wait time is 30 seconds after completion of the second reading of the question before another question is asked. You may continue to work on a problem while the next question is being read. The value of each question is a one or zero. Each student will be asked the same eight questions. Individual scores used to determine individual placing will be determined by the sum of the Mental Math score and the Individual Test score for each individual. In addition, the top three Mental Math scores from one team will be totaled and doubled and will contribute to 25% of the team score.*

#	Problem
1	What is the sum of the even integers between 1 and 11?
2	If I flip a fair coin 3 times, in how many ways can I get exactly 2 heads?
3	A rectangle with integer width and length has an area equal to 60. How many different perimeters are possible?
4	If f of x equals three x plus ten; what is f-inverse of thirty-seven?
5	A rectangle measuring 12 by 6 inches is divided into 4 triangles by drawing its two diagonals. What is the smallest area of any of the triangles in square inches?
6	What is the sum of the integers from negative ten to positive fifteen inclusive?
7	In the graph of the parabola, 12 y equals x-squared minus 4 x plus 7, [PAUSE] what is the distance from the vertex to the focus?
8	I am dealt two cards from a standard 52-card deck. In how many ways can I get a pair, that is, two cards of the same value; 2-fours, 2-kings, etc.?

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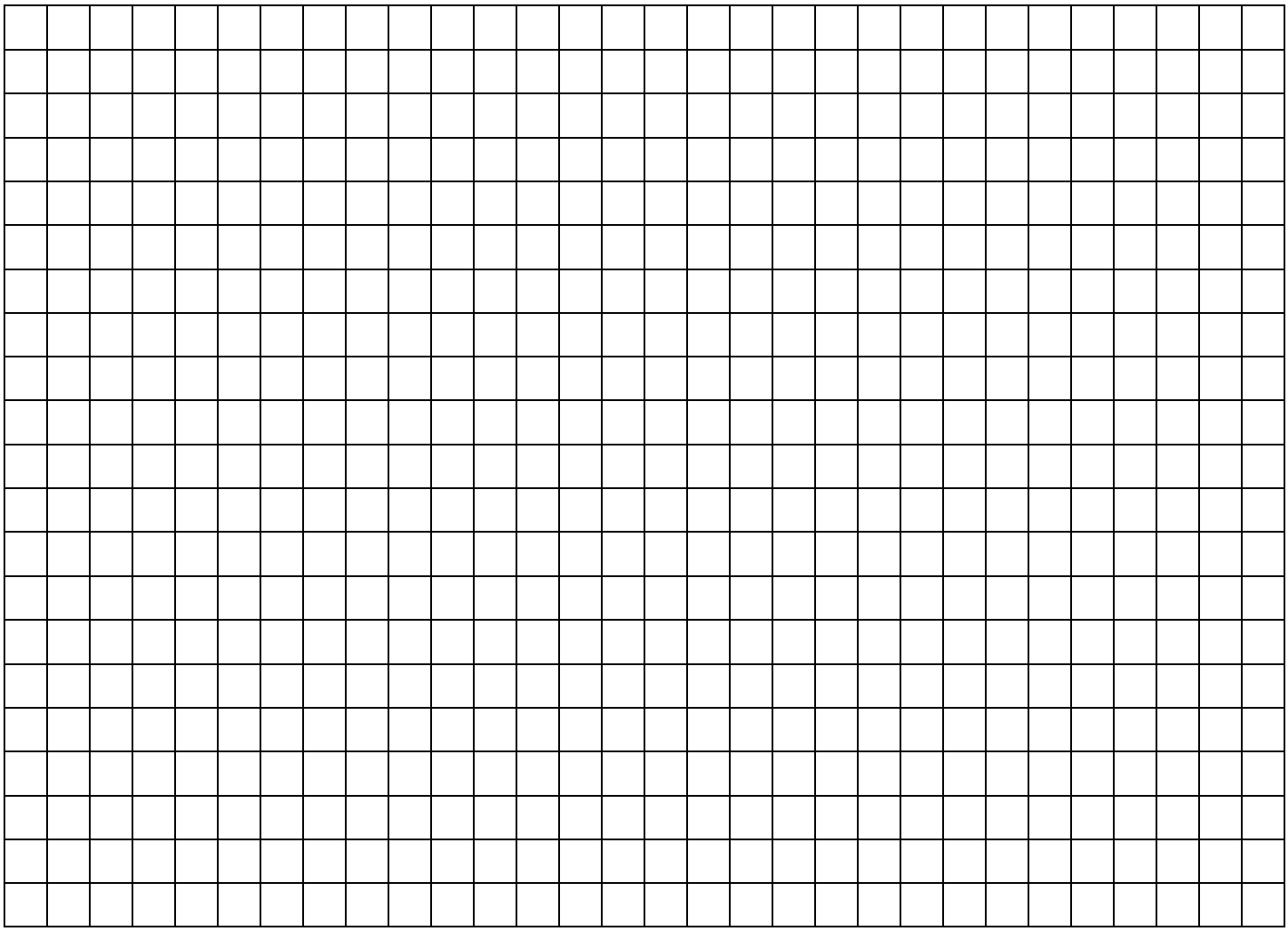
High School Individual Contest

Tear this cover sheet and scratch paper off and fill out the top of the colored answer sheet prior to the start of the test. The graph below is for your use, if needed.

INDIVIDUAL TEST – High School - 35 minutes

You may NOT be seated next to anyone from your school. If you are MOVE NOW to avoid being disqualified! When you are prompted to begin, tear off the colored sheet and begin testing. Make sure your name and school are recorded on the answer sheet. The raw score will be 2 points for correct answers to problems 1-30 and 3 points for 31-40. Record your answers on the score sheet. No talking during the test. You will be given a 5 minute time warning.



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High School Individual Contest

	Questions 1-30: 2 points each
1	Calculate: 106^2.
2	How many of the following are rational numbers $\left\{\pi, 4, \sqrt{2}, \sqrt{4}, \frac{1}{7}\right\}$?
3	Solve for x: $4(x+5)-6=2(3x-1)+2$
4	A store owner has a sale that reduces the price of a coat by 20%. By what percent does she have to raise the price to get back to the original cost?
5	Evaluate: $17-14-((5-3)^2-6)-9/3$.
6	What is the sum of the solutions to the equation: $x^2-1=3(x+1)$
7	What is the largest prime factor of $2^{12}-1$?
8	A square is inscribed in a circle of area 18π square centimeters. What is the area of the square, in square centimeters?
9	Three couples go to a movie and sit in the same row in six consecutive seats. In how many ways can they sit if the couples stay next to each other?
10	There are 463 students in the tenth grade at King High School. Each student takes a class during each of the 6 periods in a day and class size is restricted to 28 students. Each instructor teaches at most 5 classes; what is the minimal number of instructors required to teach the tenth graders?
11	Two congruent circles of radius 6 have centers that are 20 units apart. The length of a string stretched around the exterior of the circles has length $m+n\pi$, what is $m+n$?
12	A right triangle with integer side lengths has one side of length 7. What is the sum of lengths of the other two sides?
13	What is the largest perimeter of a rectangle of area of 12 square centimeters that can be constructed using integer side lengths?
14	My scores on the first four tests are: 87, 84, 94 and 91. The last test is worth double. What do I have to score to have an overall average of 90?
15	A dodecahedron has 12 regular pentagons as faces. How many vertices does it have?
16	How many positive three-digit numbers are odd and divisible by 23?
17	How many 4-digit binary numbers are 2-digit base 10 numbers?
18	The equation of the line that goes through the point (2, 4) and is parallel to the line $3x-2y=1$ is written in the form: $Ax+By=C$ where A is positive and A, B, and C have no common factors. What is $\lvert A+B+C\rvert$?
19	The surface area, greater than 0, of a sphere is equal to its volume in magnitude. What is its radius?

20	My mom has 4 bills in her purse; a $1 bill, two $5 bills and a $10 bill. For my birthday, I randomly select two bills. What is the probability that I get $15 total? Multiply your answer by 12.
21	If $i = \sqrt{-1}$, what is $\frac{(1+i)^2}{i}$?
22	If $a > b > c > 0$ then how many of these statements are guaranteed to be true: $\frac{1}{a} > \frac{1}{c}$, $\frac{1}{c} < \frac{a}{b}$, $-\frac{b}{a} < -\frac{a}{c}$
23	How many degrees larger is the measure of each interior angle of a regular nonagon than a regular octagon?
24	Find the minimum value of: $x^2 + 4x + 16$
25	How many times does the graph of $\frac{x^2}{9} - \frac{y^2}{4} = 1$ cross the x-axis?
26	Find the geometric mean of 3, 9, 8.
27	A 7x4 grid is drawn on a piece of paper. If the two diagonals are drawn, how many squares on the grid have a line through them?
28	Let (x, y) be the point that is 60% of the way from the point $(2, 3)$ to the point $(7, -7)$. What is $x + y$?
29	Of these points what is the maximum number of points that are collinear? $\{(0,-1),(1,2),(3,0),(1,1),(-3,-2)\}$
30	If $\sqrt{x} + \sqrt{y} = 7$ and $xy = 9$, what is $x + y$?

Challenge Questions: 3 pts each	
31	How many prime numbers less than 200 can be expressed as the difference of two positive perfect cubes?
32	What is the determinant of the matrix $\begin{bmatrix} 1 & 3 & 6 \\ 8 & 0 & 4 \\ 0 & 5 & 3 \end{bmatrix}$?
33	What is the average of all 2-digit numbers whose digits consist only of the numbers 1, 3, 4 and 8?
34	A contractor bids a remodel quoting 3 days to complete the job with her current crew of workers. If she had 3 more workers, the crew could finish in 2 days. If all workers do the same amount of work each day, how long would it take for one worker to complete the job?
35	How many prime numbers are greater than $10! + 1$ and less than $10! + 10$?
36	How many real solutions are there to the equation: $3x^5 + x^3 + 5x^2 + 6 = 0$?
37	The expression $(a + b + c + d)^6$ is expanded and like terms combined. How many terms are in the resulting expression?
38	An angle is chosen randomly from the interval $\theta \in [0, 2\pi)$. Let *p* be the probability that $\cos(2\theta) > \cos(\theta)$. What is 12 times *p*?
39	A triangle has sides of length 10, 14, and 16. The altitude is drawn from the vertex to the side of length 16 and divides it into two smaller segments. What is the length of the shorter segment?
40	Let x and y denote nonzero integers. How many ordered pairs (x, y) are there that satisfy the following equation? $$\frac{1}{x} + \frac{1}{y} = \frac{1}{12}$$

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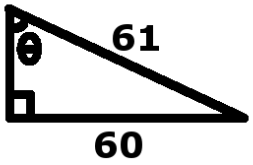
Individual Multiple Choice Contest

1	Which of the following is equivalent to $3^x + 3^x + 3^x + 3^x + 3^x + 3^x$? A) 6^x B) $2 * 3^{x+1}$ C) $2 * 3^x$ D) $6 * 3^{x+1}$ E) $NOTA$
2	List J, K and L from smallest to largest: $J = 11^{34}, K = 169^{17}, L = 3^{68}$ A) $K\ J\ L$ B) $J\ K\ L$ C) $L\ J\ K$ D) $L\ K\ J$ E) $NOTA$
3	Find $sec\theta$.  A) $\frac{3}{20}$ B) $\frac{61}{9}$ C) $\frac{60}{11}$ D) $\frac{61}{11}$ E) $NOTA$
4	How many subsets of 4 elements are there in the set defined as all positive integers less than or equal to 12? A) 1485 B) 495 C) 24 D) 990 E) *NOTA*
5	Find the units digit of $3487^{49} * 31728^{102}$. A) 2 B) 4 C) 6 D) 8 E) *NOTA*
6	Write the base 12 repeating decimal $0.2\overline{4}_{12}$ as a fraction in base 10. A) $\frac{24}{143}$ B) $\frac{1}{5}$ C) $\frac{11}{45}$ D) $\frac{13}{66}$ E) $NOTA$
7	Three standard six-sided dice are rolled. What is the probability that their results sum to 6? A) $\frac{5}{36}$ B) $\frac{1}{18}$ C) $\frac{5}{108}$ D) $\frac{1}{9}$ E) $NOTA$
8	What is the area of the ellipse defined by: $4x^2 + 9y^2 - 16x + 18y = 11$? A) π B) 6π C) 12π D) 24π E) $NOTA$
9	At a picnic, 5 identical pies are given out to 5 people at random, where anyone could have 0-5 pies. How many ways can the pies be given out? A) 120 B) 126 C) 180 D) 625 E) *NOTA*
10	$(7x^2 + 3x - 6)^4 = Ax^8 + Bx^7 + \cdots + Hx + I$ What is the value of $A + B + \cdots + H + I$? A) 16 B) 144 C) 228 D) 256 E) *NOTA*

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Team Contest

1	How many positive integers less than 30 are relatively prime to 30?
2	We begin with 100 pounds of ice and we make 50 more pounds each day. During <u>each</u> of the 12 daylight hours per day, there is a 50% chance that a random amount of ice between 5 and 10 pounds will melt. How many days must pass before we expect to have 200 pounds of ice?
3	What is the positive difference between 2016 and the sum of its proper factors?
4	Find the average of the roots of the polynomial equation: $$x^3 - 21x^2 - 2016 = 0$$
5	Evaluate: $$\cfrac{-1}{\cfrac{-1}{\cfrac{-1}{\ddots} - \sqrt{2+\sqrt{2+\sqrt{2+\cdots}}}} - \sqrt{2+\sqrt{2+\sqrt{2+\cdots}}}}$$
6	What is the number of edges in a regular icosahedron?
7	Define vectors $$\boldsymbol{x} = 4\hat{\imath} + \hat{\jmath} - 2\hat{k},$$ $$\boldsymbol{y} = 2\hat{\imath} - 3\hat{\jmath} + \hat{k},$$ $$\boldsymbol{z} = \hat{\imath} - \hat{k}.$$ The vector $\boldsymbol{P} =< 4,5,-3 >$ is expressible as a unique linear combination of **x**, **y**, and **z**. Find $a - b + c$ given that $P = a\boldsymbol{x} + b\boldsymbol{y} + c\boldsymbol{z}$.
8	A pair of circles that share a common point have common outer tangents that meet in an angle of $\frac{\pi}{3}$. What is the ratio of the large circle's radius to the smaller circle's radius?
9	The sum of the geometric series: $$\frac{13}{3} + \frac{26}{9i} - \frac{52}{27} - \frac{104}{81i} + \cdots$$ can be written as $a + bi$, where $i = \sqrt{-1}$. What is $a - b$?
10	Two turtles, Able and Bobo, eat from the same dish that contains 20 food nuggets. The amount that each turtle wishes to eat is uniformly spread from 0 to 20 nuggets (i.e. each one has equal probability) and their hungers are independent. Let $\frac{m}{n}$, in lowest terms, be the probability that both Able and Bobo will be able to eat their desired portion. What is $m + n$?

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Pressure Round Contest

1	The positive integers are placed into sets according the pattern: {1}, {2,3}, {4,5,6}, {7, 8, 9, 10}, etc. If T_n is the sum of the elements in the *n*th such set, what is T_{20}?
2	Let *r*, *s*, and *t* be the solutions to the following equation: $x^3 - 3x^2 + 5x - 8 = 0$. What is $r^2 + s^2 + t^2$?
3	Mike chooses a 5-digit positive integer, rearranges its digits yielding a smaller number and subtracts the new integer he gets from the original integer. He then multiplies that difference by an unknown 3-digit integer to get the number S. Six of the seven digits of S, in random order, are 8, 1, 2, 9, 9 and 4. What is the 7th digit of S?
4	On the last exam, the girls in the class averaged 89 while the boys averaged 77. The overall class average was 81. Let G be the reduced fraction of the class that are girls. What is the sum of the numerator and denominator of G?
5	An arithmetic sequence has $a_3 = 12$ and $a_7 = 15$. What is the sum $a_7 + a_8 + \cdots + a_{15}$?

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COLLEGE KNOWLEDGE BOWL ROUND #1 – SET 1

#	Problem	Answer
1	What is the number that is 4 times the cubed root of 512?	32
2	How many positive factors does 68 have?	6 [factors]
3	How many integers are between the square root of 60 and the square root of 1000?	24
4	If a city of 100 people increases by 25 in the first year, then 60 percent more in the second year. How many people are in the city after the second year?	200 [people]
5	What is the sum of the base 7 numbers: one-three-six and two-four-four, expressed in base 7?	$413_{[7]}$, four-one-three [base 7]
6	What is the sum of the first 10 Fibonacci numbers if the first number is one?	143
7	How many ways are there for a haberdasher to sell one hat each to 4 people out of a stock of 8 distinct hats?	1680 [ways]
8	What is the difference between the sum of the first 5 prime numbers and the next 5 prime numbers?	73
9	What is the square root of the sum of the first five positive perfect cubes?	15
10	Polygons are made by connecting vertices of a regular dodecagon. How many regular polygons can be made?	10 [polygons]

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COLLEGE KNOWLEDGE BOWL ROUND #2 – SET 2

#	Problem	Answer
1	An octopus, with 8 legs, is in class with 5 crabs and 3 dogs. If crabs have 6 legs how many legs are in the classroom?	50 [legs]
2	What is the sum of the factors of 78?	168
3	What is the sum of the digits in 8 factorial?	9
4	120 has n factors, how many positive factors does n have?	5 [factors]
5	How many of the first 30 positive palindromes are not multiples of 11?	20 [palindromes]
6	How many ways are there to reorder the letters in the word 'C-A-L-C-U-L-U-S'?	5040 [ways]
7	The average test score in a calculus class of 20 students is 75%. What is the minimum number of additional students at 100% would need to join the class to make an average class test score at least 85%?	14 [students]
8	There is a farm with cows and chickens. Between the cows and chickens, there are 46 legs and 18 heads. How many chickens are there?	13 [chickens]
9	What is the largest common factor of five hundred sixteen and three hundred seventy-two?	12
10	An isosceles trapezoid has base angles of 60 degrees. The lengths of the bases are 5 and 21 units. What is the length of one of its diagonals?	19 [units]

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COLLEGE KNOWLEDGE BOWL ROUND #3 – SET 3

#	Problem	Answer
1	What is the sum of the roots of the polynomial four x-cubed minus 3 x plus 9?	0
2	What is the units digit of 24 to the power of 16?	6
3	The mean of 4 numbers is 50. If the mean of two of those numbers is 65, what is the mean of the other two numbers?	35
4	A cube is inscribed in a sphere with a surface area of one hundred forty-four pi. What is the surface area of the cube?	288 [sq units]
5	How many times greater is one hundred two factorial than one hundred factorial?	10302
6	What is the product of five plus four i and its conjugate?	41
7	What is 5 factorial times 6 factorial divided by 7 factorial represented as a mixed number?	17 and 1/7
8	The sum of x squared and y squared is 58, the quantity x plus y squared is equal to 16. What is the value of the quantity x times y.	-21
9	How many three-digit numbers are there such that the digits appear in increasing order, such as one-two-three not four-five-two?	84
10	What is the cotangent of the angle in the first quadrant if the sine of the angle is twenty one over twenty nine?	20/21

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COLLEGE KNOWLEDGE BOWL ROUND #4 – SET 4

#	Problem	Answer
1	What is the least common multiple of the numbers 4, 6 and 7?	84
2	How much larger is the mean of the smallest 50 positive integers than the mean of the largest 50 negative integers?	51
3	What is the sum of the first 5 decimal places of the quantity 584 divided by 999?	30
4	What is the maximum number of points at which a circle can intersect a pentagon?	10 [points]
5	What is the smallest of the three consecutive numbers that sum to negative one hundred sixty two?	-55
6	A glass is three fourths full and one eighth of glass capacity is emptied to fill a glass that can hold 15 ounces. How much liquid was originally in the first glass?	90 [ounces]
7	I have a spinner separated into 7 equal sections numbered one to seven. What is the probability of spinning a sum of seven with two spins?	6/49
8	Amy and Bert go to the store with the same amount of money, Amy spends $435 and Bert spends $324 and has two-fifths of his money left. How many dollars did Amy have left?	[$] 105
9	4 people can paint a fence in 7 hours. How many people would be needed to paint the fence in two hours?	14 [people]
10	If the log base b of 32 is five-thirds, what is the base b?	8

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COLLEGE KNOWLEDGE BOWL ROUND #5 – SET 5

#	Problem	Answer
1	What is four plus five minus ten times five plus three?	−38
2	Expressed as a decimal, how many times greater is 50 times 55 than the quantity 20 times 25?	5.5
3	How many ways can 6 people be arranged at even distances around a circular table?	120 [ways]
4	If the sum of two numbers is twenty, and the product is five, what is the sum of the reciprocals of the two numbers?	4
5	What is the 17^{th} term in the arithmetic sequence whose second term is 5 and whose common difference is 1.8?	32
6	One hundred eighty-six plus x is equal to sixty percent of four hundred sixty five. Find x.	93
7	If f of x is eighteen minus four x, what is f-inverse of negative ten?	7
8	A pyramid has a base of 50 and a height of 8, if the base area is doubled and the height is halved, What is the ratio of the new volume to the old volume?	1 OR 1 to 1.
9	What is the minimum distance from the line with equation four x minus three y plus four equals zero to the point three comma two?	2 [units]
10	What is the volume of the shape with equation x squared over four, plus y squared over sixteen, equals one minus z squared over nine?	32 pi [cu units]

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COLLEGE KNOWLEDGE BOWL ROUND #6 – SET 6

#	Problem	Answer
1	The units digit and the hundreds digit are interchanged in the number 6574. What is the sum of the original number and the new number?	13049
2	Evaluate the area between the x axis and the line y equals 4 x plus 6 from x equals 1 to 4.	48 [sq units]
3	The three-digit number 1 D 3 is divisible by the number 3. What is the product of all the possible values for the digit D?	80
4	Evaluate 7 to the 4^{th} power.	2401
5	If today is a Monday what day of the week is five hundred sixty four days after tomorrow?	Saturday
6	What is the area of the shape with vertices at the point three comma one, the point one comma negative one, the point negative three comma one and the point negative two comma negative one?	9 [sq units]
7	In the binomial expansion of 2x plus 3y quantity to the 6^{th} power. What is the coefficient in front of the x-cubed, y-cubed term?	4320
8	Fully factor 6 x squared plus 5 x minus 6.	3x minus 2 times 2x plus 3 OR reversed
9	There is a cow tied to the outside corner of a square barn that measures 20 feet on each side. If the rope holding the cow is 24 feet long. How much area can the cow reach?	440 pi
10	What is the maximum value of the function f of x equals x cubed minus 6 x squared plus 9 x minus 6 on the closed interval from 0 to 3?	-2

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High School – October 19, 2016

COLLEGE KNOWLEDGE BOWL ROUND – EXTRA

#	Problem	Answer
1	What is the measure in degrees of the smaller angle between the hour and minute hands of a analog clock at four forty-four?	122 [degrees]
2	How many two digit numbers do not contain a prime number as one of the digits?	30 [numbers]
3	38 is what percent of 95?	40 [%]
4	You take out a loan of $3500 and you pay the principle and 60% interest. How much will you pay back in total?	[$] 5600
5	What is 75 times 750?	56250
6	How many seconds are there in 3 hours?	10800
7	Find the harmonic mean of 3 and 27.	Twenty seven over five. $\frac{27}{5}$

Final Score:

KEY

(Out of 8)

"Math is Cool" Championships -- 2016-17

School:_____Room # _____ Team #_____

Name: _____Proctor: _____

High School **Mental Math** – 30 sec per question

8 problems read orally to everyone - Approximately 8% of Individual Score - 25% of team score

When it is time to begin, the proctor will read the first question twice. You may not do any writing or talking while arriving at a solution. Once you have a solution, record it on the sheet in front of you. ***You may not change or cross out answers once you have written an answer down. If there are eraser marks, write-overs, or crossed-out answers, they will be marked wrong.*** *Once all students have laid their pencils on the desk, another question will be asked. If a student doesn't lay his/her pencil down, the maximum wait time is 30 seconds after completion of the second reading of the question before another question is asked. You may continue to work on a problem while the next question is being read. The value of each question is a one or zero. Each student will be asked the same eight questions. Individual scores used to determine individual placing will be determined by the sum of the Mental Math score and the Individual Test score for each individual. In addition, the top three Mental Math scores from one team will be totaled and doubled and will contribute to 25% of the team score.*

	Answer	1 or 0	1 or 0
1	30		
2	3 [ways]		
3	6		
4	9		
5	18 [sq in]		
6	65		
7	3		
8	78 [ways]		

Math is Cool" Championships – 2016-17

9th & 10th Grade – October 19, 2016

Final Score:

KEY

Student Name _____

Proctor Name _____ Room # _____

First Score

(out of 20)

SCHOOL NAME _____ **Team #**_____

INDIVIDUAL MULTIPLE CHOICE - 15 minutes – 10 problems – 20% of team score

This test is the only test where you will be penalized for incorrect responses. You will receive 2 points for a correct letter response, 0 points for leaving it blank and -1 point for an incorrect response. It is not necessary to write your personal name on the test, but you may put it at the bottom of the test so your coach will be able to give you back the correct test. This test is taken individually, but it is part of your team score, including zeros for missing team members. Your team score will be calculated by taking the mean of your four team members' scores. When you are prompted to begin, tear off the colored sheet and begin testing. ***Since this is a multiple choice test, ONLY a letter response should be indicated as an answer on the answer sheet.*** *No talking during the test.*

DO NOT WRITE IN SHADED REGIONS

Answer		-1, 0 or 2	-1, 0 or 2
1	B		
2	C		
3	D		
4	B		
5	D		
6	D		
7	C		
8	B		
9	B		
10	D		

"Math is Cool" Championships – 2016-17

9th & 10th Grade – October 19, 2016

Final Score: KEY

SCHOOL NAME _____ **Team #** _____

First Score

(out of 10)

Proctor Name _____ Room # _____

Team Contest – Score Sheet

TEAM TEST - 15 minutes – 30% of team score

*When you are prompted to begin, tear off the colored sheet and give a copy of the test to each of your team members and begin testing. Each problem is scored as **1 or 0**. Record all answers on the colored answer sheet.*

DO NOT WRITE IN SHADED REGIONS

	Answer	1 or 0	1 or 0
1	8 [integers]		
2	20 [days]		
3	4536		
4	7		
5	1		
6	30		
7	1		
8	3		
9	5		
10	32		

"Math is Cool" Championships – 2016-17

9th & 10th Grade – October 19, 2016

Final Score:
KEY
First Score

Proctor Name _____ Room #_____

SCHOOL NAME _____ Team #_____

PRESSURE ROUND - 10 minutes – 5 problems - 5 rounds – 15% of team score

When it is time to begin, you will be handed a packet of five problems. There is a copy of the problems for each team member. Two minutes after the start of the test you are expected to submit an answer for one of the problems (it can simply be a guess). The maximum value of this answer is 1 point. In another two minutes you are expected to submit another answer to one of the four remaining problems; its maximum value is two points. This process will continue until all the problems are answered and each consecutive problem's worth will go up by one point. You must submit your answers on the colored sheets given to you. If you do not have an answer at the end of a two minute period, you must still submit an answer sheet with an identified problem number on it. Failure to do so will result in loss of points. This event is timed, and you will be given a verbal 5 second warning and told to hold your answer sheet up in the air. You may keep working as the sheets are collected. If a team answers the same question more than once, only the first answer will be scored and the other attempts will be ignored.

Pressure Round Answers

	Answer
1	4010
2	-1
3	3
4	4
5	162

Final Score:

(Out of 8)

"Math is Cool" Championships -- 2016-17

School:_____Room # _____ Team #_____

Name: _____Proctor: _____

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	Answer	1 or 0	1 or 0
1			
2			
3			
4			
5			
6			
7			
8			

Math is Cool" Championships – 2016-17

9th & 10th Grade – October 19, 2016

Final Score:

Student Name _____

Proctor Name _____Room # _____

First Score
(out of 20)

SCHOOL NAME _____**Team #**_____

INDIVIDUAL MULTIPLE CHOICE - 15 minutes – 10 problems – 20% of team score

This test is the only test where you will be penalized for incorrect responses. You will receive 2 points for a correct letter response, 0 points for leaving it blank and -1 point for an incorrect response. It is not necessary to write your personal name on the test, but you may put it at the bottom of the test so your coach will be able to give you back the correct test. This test is taken individually, but it is part of your team score, including zeros for missing team members. Your team score will be calculated by taking the mean of your four team members' scores. When you are prompted to begin, tear off the colored sheet and begin testing. ***Since this is a multiple choice test, ONLY a letter response should be indicated as an answer on the answer sheet.*** *No talking during the test.*

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2			
3			
4			
5			
6			
7			
8			
9			
10			

"Math is Cool" Championships – 2016-17

9th & 10th Grade – October 19, 2016

Final Score:

SCHOOL NAME _____ **Team #** _____

First Score
(out of 10)

Proctor Name _____ Room # _____

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	Answer	1 or 0	1 or 0
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			