"Math is Cool" Championships – 2013-14

October 18, 2013

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	10 [cm]		
2	[y=] -3, 5 [either order]		
3	42		
4	[x=] 3		
5	A C B [in that order]		
6	$\sqrt{3}$ [inches]		
7	36 [pencils]		
8	72 [sq cm]		
9	0		
10	144 [degrees]		
11	22		
12	1/9		
13	264 [cubic inches]		
14	Average [income]		
15	1/2		
1-15 TOTAL:			

	Answer	1 or 0	1 or 0
16	1/13		
17	186		
18	8 [pairs]		
19	11		
20	$m + 16$		
21	5/9		
22	76		
23	7 [mm]		
24	[x=] -2		
25	28		
26	92		
27	$400/\pi$ [sq meters]		
28	4096		
29	1/2		
30	11		
16-30 TOTAL:			

	Answer	1 or 0	1 or 0
31	1 [point]		
32	4		
33	$\frac{169}{24}[cm]$		
34	$\frac{37}{180}$		
35	7		
36	33		
37	-2		
38	16		
39	$\frac{\sqrt{3}+3}{6}$		
40	1		
31-40 TOTAL:			

"Math is Cool" Championships – 2013-14

October 18, 2013

Total Correct:

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 – 2013-14

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October 18, 2013

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 all 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 problems dealing with money. In the case of problems requiring dollar answers, answer as a decimal rounded to the neares 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.*

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.*

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High School – October 18, 2013

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	How many positive prime numbers are less than 30?
2	Evaluate 5 factorial minus 4 factorial.
3	What is the probability of getting a sum that is less than seven from rolling two fair six-sided dice?
4	What is the sum of the first 13 positive odd numbers?
5	How many ways can you uniquely rearrange the letters in the word MENTAL, M-E-N-T-A-L?
6	What is the surface area, in square inches, of a sphere with a volume of 36 pi cubic inches?
7	How many palindromes are there between 200 and 400?
8	How many integers, x, satisfy the inequality: the absolute value of the quantity 4x minus 2 is less than 20?

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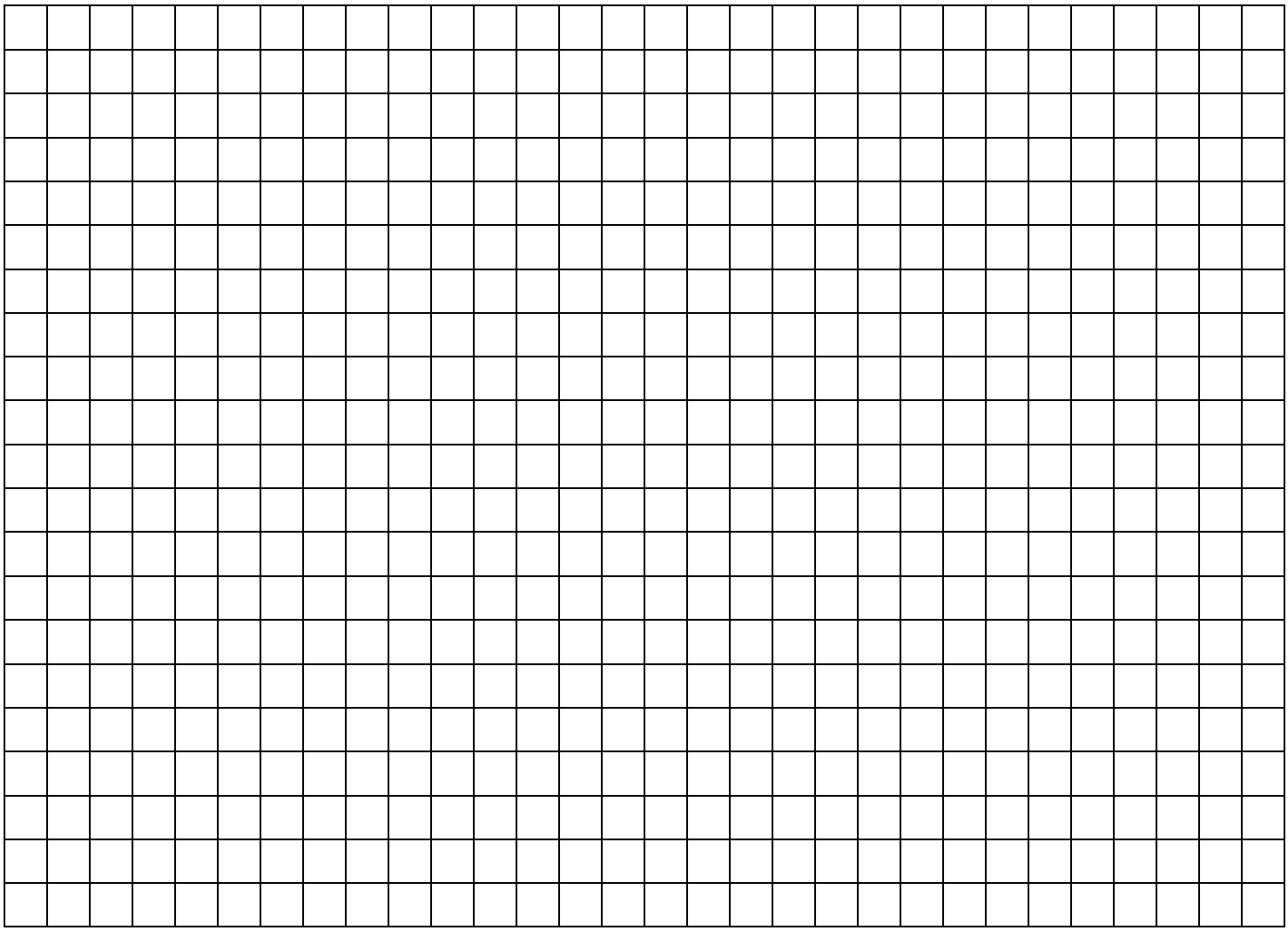
High School Individual - October 18, 2013

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 - 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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October 18, 2013

High School Individual Contest

	Questions 1-30: 2 points each
1	The area of a right triangle is 24 sq cm and the length of one of the legs is 6 cm. What is the length of the hypotenuse in cm?
2	Solve for *y*: $4y^2 - 8y - 60 = 0$
3	What is the sum of the missing numbers in the arithmetic sequence: 12, ____, ____, 30?
4	Solve for *x*: $4(2x - 1) - (x - 3) = 3x + 11$
5	Let: $A = 2^{20}$ $B = 5^{10}$ $C = 17^5$ Put the values A, B, C in order from smallest to largest.
6	What is the length, in inches, of the altitude of a equilateral triangle with side length 2 inches?
7	Pencils cost 12 cents each while erasers cost 20 cents. I have \$5.00 and I need 3 erasers and as many pencils as I can buy. How many pencils can I buy?
8	What is the area, in square centimeters, of a square with a diagonal of 12 cm?
9	Evaluate: $(4 - 5)^3 + 2 - 1$.
10	What is the measure, in degrees, of an interior angle in a regular decagon?
11	If $g(x) = 3x^2 - 2x + 1$. What is $g(3)$?
12	Simplify and write as a reduced fraction: $3^4 \cdot 9^{-3}$.
13	Three faces of a rectangular parallelepiped (box) have areas of 33, 44, and 48 square inches. What is the volume of the box? Express your answer in cubic inches.
14	Suppose that incomes in the United States are "right-skewed", which is bigger: the average income or the median income?
15	What is the slope of the line perpendicular to the line $4x + 2y = 5$?
16	Let $i = \sqrt{-1}$ and *a* and *b* be real numbers. If $(a + bi)(3 + 2i) = 1$, what is $(a + b)$?
17	The sum of two numbers is 31 and their positive difference is 6, what is the positive difference of their squares?
18	How many ordered pairs of positive integers (x,y) satisfy the equation $20x + 13y = 2013$?
19	Let $f(x) = mx + b$ be a linear function. If $f(2) = 8$ and $f(5) = -1$, what is the sum $m + b$?
20	The sum of 4 consecutive numbers is m. What is the sum of the next 4 consecutive numbers in terms of m?

21	A six-sided die, numbered 1 through 6, is made so that prime numbers are twice as likely as non-prime numbers to turn up. What is the probability of rolling an odd number?
22	A square 3 by 3 grid of points is formed. How many triangles can be made by connecting three of the points?
23	The three altitudes in a right triangle are: $\frac{10\sqrt{6}}{7}, 2\sqrt{6}, \text{and } 5$ mm. What is the length of the hypotenuse?
24	For what value(s) of *x* are the points: $(x, 2x+1), (1,2), \text{and } (7,12)$ collinear?
25	In how many zeroes does 123! end when expressed in base 10?
26	In how many different ways can Richard pay for a $1.95 Americano if he only has quarters, dimes, and nickels?
27	In square meters, what is the largest area you can enclose with 40 meters of fencing?
28	Solve for x: $\log_2 \log_4 \log_8 x = 0$
29	What is the probability that a randomly selected factor of 63,946 is even?
30	Let $lcm(a, b)$ be the least common multiple of *a* and *b*. What is: $$\frac{lcm(1,2,3,\ldots,20)}{lcm(12,13,14,\ldots 20)}?$$

Challenge Questions: 3 pts each

31	At how many points does the graph of $y = (x+3)(x-2)^2(x-3)^2 + 2$ intersect the x-axis?
32	The base 6 number 4232x23 is divisible by 5, what is the value of the digit 'x'?
33	A triangle with side lengths of 13 cm, 13 cm, and 10 cm is inscribed in a circle. What is the radius, in cm, of the circle?
34	Evaluate: $$\sum_{x=1}^{\infty} \frac{1}{x^2+9x+18}$$.
35	Fifteen factorial equals 1,307,6*y*4,368,000, where *y* represents a digit 0 through 9. What is *y*?
36	What is the largest integer *n* for which $$\frac{4n^2-13n+17}{n-4}$$ is also an integer?
37	If a point reflected across the line $y = x - 1$, becomes $(-6, 4)$, what is the sum of the coordinates of that point?
38	Let $f(x) = 2x^2 + 5x - 3$ and $g(x) = 2x + 5$. What is the sum of the coefficients of: $\Big(f\big(g(-1-x)\big)\Big)^2$?
39	A solid regular octahedron is sliced in half, creating two square pyramids. What is the ratio of the surface area of one of the pyramids to the surface area of the original octahedron? Express your answer as a single fraction with an integer denominator.
40	Evaluate: $\frac{1}{3} + \frac{3}{9} + \frac{5}{27} + \frac{7}{81} + \cdots$

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11th & 12th Grade – October 18, 2013

Individual Multiple Choice Contest

1	Find the units digit of $3^{24}\times5^{27}\times7^{12}\times11^{13}$. A) 1 B) 3 C) 5 D) 7 E) Answer not given.
2	Which of the following is equivalent to $2^x + 2^x + 2^x + 2^x$? A) 2^{2x} B) 2^{4x} C) 4^x D) $8^{\frac{x+2}{3}}$ E) Answer not given.
3	How many distinct triangles exist with sides of integer length and perimeter equal to 10? A) 2 B) 3 C) 4 D) 6 E) Answer not given.
4	Let *T* be a set of positive integers. What is the maximum number of elements of *T* if no subset of three numbers has a sum that is a multiple of 3? A) 3 B) 4 C) 5 D) 6 E) Answer not given.
5	Let *m* and *n* be positive integers and $m + n + mn = 118$. What is $m + n$? A) 19 B) 21 C) 22 D) 24 E) Answer not given.
6	A cube with a side length of 7 units is painted purple and then cut up into 343 one-unit cubes. What is the number of one-unit cubes with two faces painted? A) 8 B) 60 C) 125 D) 150 E) Answer not given.
7	If $\alpha = 15°$, what is the value of $(\sin\alpha + \cos\alpha)^2 - \sin(2\alpha)$? A) 0 B) $\sqrt{2}/2$ C) $\sqrt{3}/2$ D) 1 E) Answer not given.
8	Which triangle with side lengths given below has the largest area? A) 8, 15, 12 B) 8, 15, 15 C) 8, 15, 17 D) 8, 15, 19
9	Let $P(x)$ be a polynomial with integer coefficients that has roots of 3 and 7. Which of these values could be equal to $P(5)$? A) 7 B) -16 C) 15 D) 9 E) Answer not given.
10	What is the combined number of horizontal and vertical asymptotes of the function: $$g(x) = \frac{e^{-x}(x^2 + x - 12)}{x - 3}$$ A) 0 B) 1 C) 2 D) 3 E) Answer not given.

"Math is Cool" Championships – 2013-14

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Team Contest

1	What is the ratio of the area of an equilateral triangle to that of a regular hexagon with the same perimeter? (use reduced a:b notation)
2	Find the determinant of the following matrix: $\begin{bmatrix} 1 & -2 & 3 & 2 \\ 2 & 1 & -3 & 1 \\ 0 & 0 & 4 & 2 \\ -1 & 2 & -3 & 3 \end{bmatrix}$.
3	Find the area of a triangle with side lengths 11 cm, 13 cm, and 20 cm. Express your answer in square centimeters.
4	Evaluate: $\frac{1\times2\times4 + 2\times4\times8 + 3\times6\times12 + \cdots + 6\times12\times24}{1\times4\times16 + 2\times8\times32 + 3\times12\times48 + \cdots + 6\times24\times96}$
5	The sequence of triangular numbers begins: 1, 3, 6, 10, 15, and continues in like manner. Of the first 100 numbers in the sequence, how many are divisible by 11?
6	Find the sum of all solutions x to the following equation on the interval $-10\pi < x < 10\pi$: $\frac{1}{2}\sin\left(\frac{x}{2}\right) + \cos\left(\frac{x}{4}\right) = \sin\left(\frac{x}{4}\right) + 1$
7	The average score on the algebra test taken by the 35 students in the class was 84. The boys averaged 80 and the girls averaged 87. How many boys are in the class?
8	Stacey has access to as many 37 and 19-cent stamps as she needs. What is the largest postage amount, in cents, that she cannot obtain exactly?
9	In how many ways can the letters of the word PSIONIC be uniquely rearranged such that no vowel is in an odd-numbered place?
10	Evaluate: $\int_{\sqrt{7}}^{3} \frac{7x}{4(x^2-6)^2}\,dx$

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Pressure Round Contest

1	How many subsets of {1,2,3,4,5,6,7,8,9} with three elements exist such that the sum of the three elements is a multiple of 3?
2	Find the coefficient of the x^4 term in the binomial expansion of $3x^3(3x+4)^4$.
3	Suppose that angle A is in the first quadrant and the $\cos A = \frac{3}{\sqrt{10}}$. What is $\log(\sin A) + \log(\cos A) + \log(\tan A)$?
4	If $0 < \theta < \frac{\pi}{2}$ and $\tan 2\theta = \frac{5}{12}$, what is the value of $\sin\theta$?
5	An ant is crawling on the surface of a regular tetrahedron ABCD with edges measuring 12 units. If the ant is currently at point X on edge AB such that AX=3. What is the shortest distance the ant can crawl to reach the midpoint of edge CD, named Y?

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COLLEGE KNOWLEDGE BOWL ROUND #1 – SET 1

#	Problem	Answer
1	What is 85 squared?	7225
2	How many seconds are in a day?	86,400 [seconds]
3	Evaluate log base 4 of 64 minus the log base 2 of one-sixteenth.	7
4	Find the slope of a line perpendicular to the line y equals negative 13x over 7 plus 14.	7/13
5	What is one-one base 2 plus two-two base 3 plus three-three base 4 plus four-four base 5? Express your answer in base ten.	50
6	How many real roots does the polynomial 6 x-squared minus 4x plus 3 have?	0
7	What is 30 mod 7?	2
8	What is the number of ways of choosing 5 students out of a class of 14 students if the order does not matter?	2002
9	If the sine of theta is negative and the tangent of theta is also negative, then which quadrant is theta in?	4
10	Six sleek swans swam swiftly southwards at 40 miles per hour. Then the six sleek swans swam swiftly back northwards the same exact distance at 60 miles per hour. What was their average speed in miles per hour?	48[mph]

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COLLEGE KNOWLEDGE BOWL ROUND #2 – SET 2

#	Problem	Answer
1	What is 67 times 73?	4891
2	In degrees, what is the measure of an interior angle of a regular octagon?	135 [degrees]
3	What is the log base 5 of 100 minus 2 times the log base 5 of 2?	2
4	What is the slope of the line going through the point one comma two and the point eight comma negative ten?	$-\frac{12}{7}$
5	Express in base four the sum of the base ten numbers 5 and 20.	$121_{[4]}$ OR one-two-one
6	What is the value of the smaller root of the polynomial x-squared plus x minus 12?	-4
7	What is the remainder when two thousand three hundred forty-five is divided by eleven?	2
8	Evaluate 7 choose 3.	35
9	If theta is in the first quadrant and the sine of theta equals three fifths, what is the sine of two times theta?	$\frac{24}{25}$
10	It takes 11 benevolent elephants 5 hours to destroy 55 elevators. How many elevators can 77 benevolent elephants destroy in 2 hours?	154 [elevators]

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COLLEGE KNOWLEDGE BOWL ROUND #3 – SET 3

#	Problem	Answer
1	What is the area of a circle circumscribed by a square with a side length of 10?	25π
2	What is the sixth Fibonacci number?	8
3	Is the following function even, odd, or neither? F of x equals the cosine of the sine of x?	even
4	What is the product of the greatest common factor and least common multiple of twenty-two and twenty-eight?	616
5	What is two hundred twenty-five degrees expressed as radians?	5π/4 [rad]
6	Find the sum of the number of sides and number of diagonals of a regular heptagon.	21
7	Evaluate the sum of the four greatest prime numbers less than 100.	348
8	What is the area, in square units, of the circle inscribed in a right triangle with legs of 5 and 12 units?	4π
9	If *f* of x equals 5x plus 2 and *g* of x equals 2x minus 4, find *f* of *g* of zero minus *g* of *f* of zero.	−18
10	Captain Hook chained up his crocodile to one corner of a rectangular barn whose base is 15 feet by 20 feet. The crocodile's chain is 17 feet long. What is the area, in square feet, the crocodile may graze on the Pirate Private Property?	871π/4 [sq ft]

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COLLEGE KNOWLEDGE BOWL ROUND #4 – SET 4

#	Problem	Answer
1	What is the volume of a pyramid whose base has an area of 37 and a height of 18 units?	222 [cubic units]
2	What is 15% of 2540?	381
3	Find the sum of the first 7 positive cubes.	784
4	What is the 15^{th} triangular number?	120
5	Evaluate 9 factorial.	362,880
6	Find the units digit of 13 to the nineteenth power.	7
7	Find the positive difference between the second smallest positive perfect number and the twelfth smallest positive prime number.	9
8	A triangle has two sides of lengths 4 and 17. What is the positive difference between the largest and smallest possible integer lengths of the third side?	6
9	Find the geometric mean of the two smallest two-digit numbers with three positive factors.	35
10	Dissatisfied with his computer's estimate that a download will take 4 hours to complete using only a wired internet connection, James also engages a wireless connection. The computer now estimates that the download will take 3 hours. How many hours would the wireless connection take to complete the entire download itself?	12 [hours]

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COLLEGE KNOWLEDGE BOWL ROUND #5 – SET 5

#	Problem	Answer
1	Evaluate three plus four times the quantity five minus three.	11
2	What is the length of the space diagonal of a rectangular prism with sides of length 5, 9, and 11?	$\sqrt{227}$ The square root of 227.
3	In how many positive integral bases can the sum two plus two be represented as a two-digit number?	2
4	What is the sum of all the positive factors of 28?	56
5	Express five pi over two radians in degrees.	450 [deg]
6	What is the probability of drawing three kings in a row, out of a standard 52-card deck, without replacement?	$1/5525$
7	For an icosahedron, what do you get when you take the number of vertices, subtract the number of edges, and add the number of faces?	2
8	What is the product of the roots of the polynomial 5 x-cubed minus 37 x-squared plus 22x plus 225?	-45
9	What is the limit as *x* approaches infinity of *x* times *e* to the minus *x* power?	0
10	Solve for x, if 4 to the power of the quantity 2x minus 1 equals 8 to the power x.	[x=] 2

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11th & 12th Grade – October 18, 2013

COLLEGE KNOWLEDGE BOWL ROUND #6 – SET 6

#	Problem	Answer
1	What is four divided by eight plus five divided by the quantity seven plus three?	1
2	Calculate the digital root of product of twenty-one and fifty-one.	9
3	In what base is the number seven seven base b equal to the base 10 number 84?	11
4	Calculate the reciprocal of the sum of the reciprocals of three and six.	2
5	Which angle between 0 and pi over 2 is coterminal to the angle negative 26 pi over 7?	2 pi over 7 $\left[\frac{2\pi}{7}\right]$
6	The probability that it rains on any given day in Seattle is 70 percent, independent of other days. What is the probability that it rains exactly 3 days out of the next 4? Answer as a decimal.	0.4116
7	Find the volume of the frustum of a cone with base radii of 5 and 10 and a height of 6 units.	$350\ pi$ [cubic units]
8	The polynomial x-cubed plus k times x-squared plus x plus 1 is divisible by the quantity x minus 1. What is the value of k?	-3
9	What is the limit as x approaches infinity of the quantity 2 x-squared plus 2x minus 7 divided by the quantity 3 x-squared plus 8x plus 10?	Two-thirds $[2/3]$
10	What is the value of x if the square root of x equals the cube root of 8 squared?	16

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High School – October 18, 2013

COLLEGE KNOWLEDGE BOWL ROUND – EXTRA

#	Problem	Answer
1	As a decimal, find the arithmetic mean of the first 8 digits in the decimal representation of pi.	3.875
2	Find the area of the region from y equals the absolute value of the quantity x minus 2 to the x-axis between x equals negative 4 and x equals 4.	20
3	What is the geometric mean of 8 and 9? Answer in simplest radical form.	$6\sqrt{2}$
4	What is the positive difference between the number nineteen and its additive inverse?	38
5	What is the area of a triangle with side lengths of 6, 7, and 11?	$6\sqrt{10}$
6	If i represents the square root of negative 1, what is the quantity 1 plus i times the quantity 1 minus i?	2

Final Score:

KEY

(Out of 8)

"Math is Cool" Championships -- 2013-14

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	10 [primes]		
2	96		
3	5/12		
4	169		
5	720		
6	36π [sq in]		
7	20 [palindromes]		
8	10 [integers]		

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11th & 12th Grade – October 18, 2013

Final Score:

KEY

Student Name_____

Proctor Name_____Room #_____

SCHOOL NAME_____ Team #_____

First Score

(out of 20)

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	C		
2	D		
3	A		
4	B		
5	C		
6	B		
7	D		
8	C		
9	B		
10	B		

"Math is Cool" Championships – 2013-14

11th & 12th Grade – October 18, 2013

Final Score: KEY

First Score (out of 10)

SCHOOL NAME_____ **Team #** _____

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	2 : 3		
2	100		
3	66 [sq cm]		
4	1/8		
5	18 [numbers]		
6	4π		
7	15 [boys]		
8	647 [cents]		
9	72		
10	$\frac{7}{12}$		

"Math is Cool" Championships – 2013-14

11th & 12th Grade – October 18, 2013

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	30
2	2304
3	-1
4	$\frac{1}{\sqrt{26}} or \frac{\sqrt{26}}{26}$
5	$3\sqrt{13}$ [units]

Final Score:

(Out of 8)

"Math is Cool" Championships -- 2013-14

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			
2			
3			
4			
5			
6			
7			
8			

Math is Cool" Championships – 2013-14

11th & 12th Grade – October 18, 2013

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.*

DO NOT WRITE IN SHADED REGIONS

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

"Math is Cool" Championships – 2013-14

11th & 12th Grade – October 18, 2013

Final Score:

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			
2			
3			
4			
5			
6			
7			
8			
9			
10			