"Math is Cool" Championships – 2012-13

Sponsored by:

6th Grade – February 8, 2013

GENERAL INSTRUCTIONS/INFORMATION applying to all tests and awards:

- *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 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).*
- *For fifth and sixth grade, all fractions and ratios must be reduced to simplest form.*
- *Counting or natural numbers refer to the numbers 1,2,3,4 and so on – zero (0) is NOT included.*
- *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.*
- *Individual Awards are determined by the sum of an individual's Mental Math score and Individual Test score. Individual Mental Math contributes to approximately 8% of the individual score. Individual ties are broken based on the following in this order: total individual points, total questions answered correctly, individual Mental Math score, total correct from Individual Test problems 31-40, total correct from Individual Test questions 16-30, single questions answered correctly on the Individual Test starting with question 40 and working backwards.*
- *Team Awards are determined by the team score which is calculated by 2(Top 3 Mental Math scores) + 2(Multiple Choice) + 6(Team) + 3(Relay) + (College Bowl) for approximate weights of 25%, 20%, 30%, 15% and 10% respectively. Team ties are broken based on highest event score in order of events starting with Mental Math.*

Mental Math Questions Attached

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Name_____Team #_____ Room #_____

School Name _____ Proctor Name_____

Mental Math Contest

MENTAL MATH - 30 seconds per question – 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.*

	Question
1	Biff and Eho went to the carnival. Eho went on 17 rides and Biff went on 14 rides. Each ride required one ticket. Together, how many tickets did they need in all?
2	Maggie and Kay share a square room with side length 14 feet. If they want to divide it equally, what is the area in square feet of Maggie's share of the room's floor space?
3	As a reduced common fraction, what is five-sixths minus one-fourth?
4	The two legs of a right triangle measure 12 and 15 centimeters. What is the area of the triangle, in square centimeters?
5	What is the product of the least common multiple and the greatest common factor of 24 and 40?
6	As a reduced common fraction, what is the probability of getting exactly 3 heads when flipping a coin 4 times?
7	At 7 o'clock, what is the degree measure of the smaller angle between the two hands of an analog clock?
8	Alice finds the sum of the digits for each 2-digit prime number less than 50. How many of Alice's sums are prime numbers?

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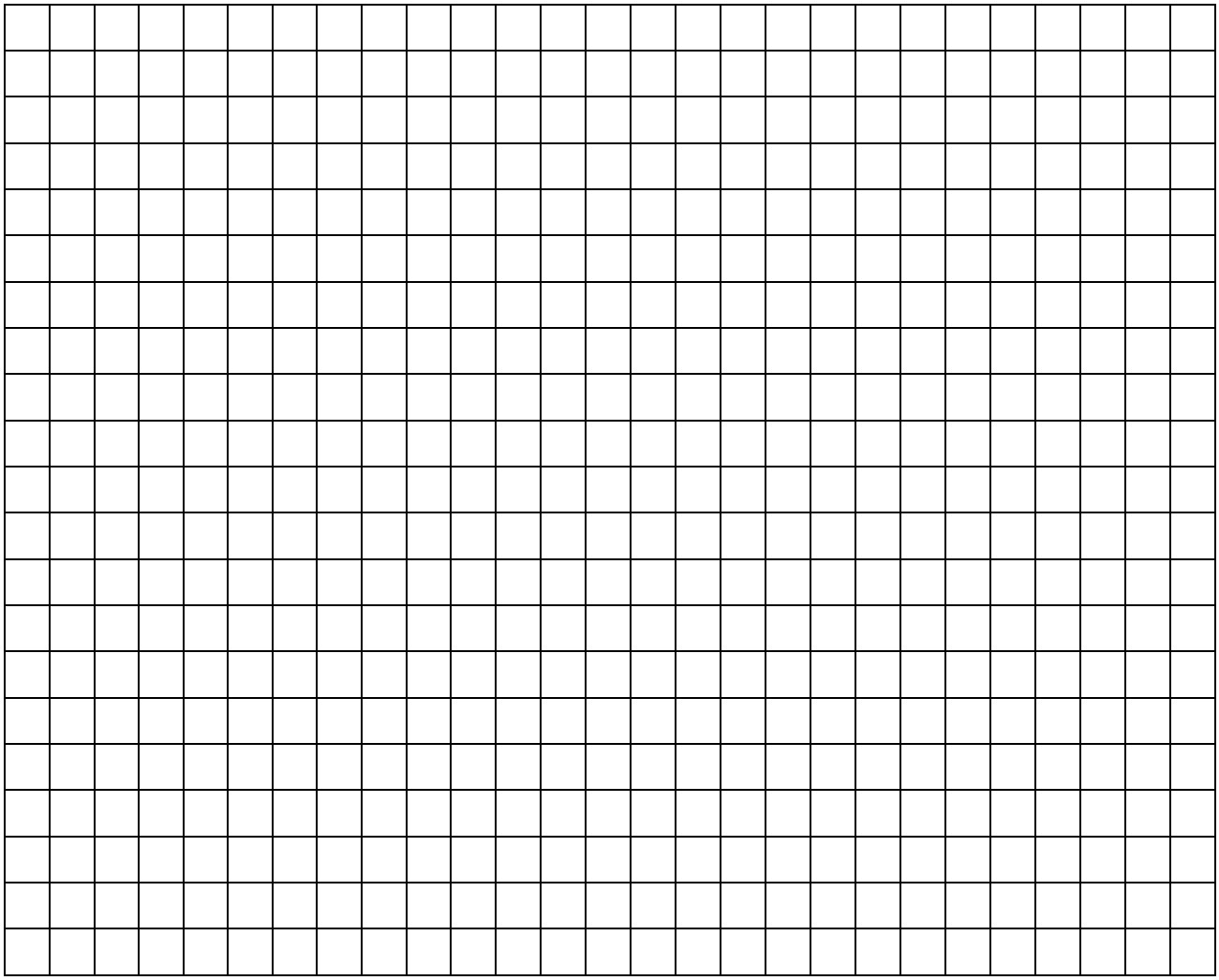
Individual Contest

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 INSTRUCTIONS - 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.



"Math is Cool" Championships – 2012-13

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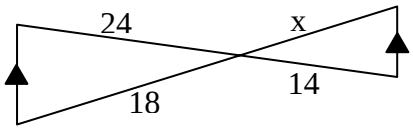
Individual Contest

INDIVIDUAL TEST - 35 minutes – 40 problems

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.

Record all answers on the colored cover sheet.

	Questions 1-30: 2 points each
1	If each bus can haul 32 mathletes, how many buses are needed to haul 160 mathletes?
2	At 3 PM, the temperature outside was 4° Fahrenheit, and at 11 PM, the temperature was -11° Fahrenheit. How many degrees did the temperature drop from 3 PM to 11 PM?
3	How many sides are on a dodecagon?
4	What is the positive difference between 5793 and 7634?
5	Write twenty-seven sixths as a simplified mixed number.
6	Abbey has 29 pencils to distribute to herself and her 3 friends. How many pencils are left after all of them have the largest possible equal number of pencils?
7	What is the sum of the positive difference and the product of 13 and 6?
8	A subway car has 6 groups of 4 seats and 2 groups of 6 seats. What is the total number of seats in the car?
9	A river flows at an average speed of 20 miles per hour. An indestructible paper boat is accidentally dropped into the river. How many miles will it travel in 6.5 hours?
10	If $4x + 11 = 20 - 2x$, what is $2x$?
11	When a fair 12-sided die is rolled, what is the probability that a composite number is on the bottom face? Answer as a reduced fraction.
12	Find the median of the following data set: {2, 1, 6, 4, 7, 3, 8, 12, 4, 7, 17, 12, 1}
13	A striped quilt consists of a repeating pattern of white, red, blue, green, blue, red, and green stripes, starting on white. What color is the 26^{th} stripe?
14	What is the greatest common factor (divisor) of 48 and 92?
15	Find the value of $\frac{10\cdot9\cdot8\cdot7\cdot6\cdot5\cdot4\cdot3\cdot2\cdot1}{6\cdot5\cdot4\cdot4\cdot3\cdot3\cdot2\cdot2\cdot1\cdot1}$

16	A = the number of diagonals that can be drawn in a square B = the probability of rolling a 6 on a fair 6-sided die C = the number of vertices on a triangle What is the product of A x B x C?
17	In the diagram below, all measurements are given in inches. Find the value of x in inches, and give your answer as a reduced fraction. 
18	What is 10% of 3/5 of 100?
19	A jar contains some marbles, of which 12 are blue. If a marble is picked randomly from the jar, the probability is 4/13 that it is blue. How many marbles in the jar are not blue?
20	There are 9 people in a room, and each person shakes each other person's hand once. How many handshakes take place?
21	Matt's rectangular yard is twice as wide as it is long and has a perimeter of 240 feet. What is the area in square feet of Matt's yard?
22	A group of horses and humans has forty heads and one hundred twelve feet. How many horses are there?
23	Shirley and some other people stand equally spaced in a circle. They number off consecutively, starting with Shirley as number 1, and increasing by one to her right. If the person with number 3 is directly opposite the person with number 15, how many people (including Shirley) are in the circle?
24	Thirty percent of my number is forty-two. What is my number?
25	I walk four miles per hour for one mile and then jog at six miles per hour for two miles. How many minutes did my entire trip take?
26	A white cube with edge length 6 is painted purple and then cut into unit cubes (that is, cubes with edge length 1). What is the positive difference between the number of unit cubes with one purple face and the number of unit cubes with two purple faces?
27	What is the surface area in square meters of a cube with a volume of 27 cubic meters?
28	What is the sum of the distinct prime factors of 2013?
29	Michael wants to frame 5 photographs. He has a single discount coupon, which would give him $30 off any framing order of $50 or more. With the coupon, he will pay $107.50. Without the coupon, what would be the average cost in dollars to frame each of his photographs?
30	In 2007, Jonathan bought his first collectible toy pony for $12. Every year, Jonathan spends twice as much on toy ponies as he did the year before. After buying his ponies for 2013, how many dollars has he spent in all on his pony collection?

Challenge Questions: 3 points each

31	Two cars are heading west on the same road, starting from the same point. The first car, traveling at 60 mph, leaves 30 minutes before the second car. How many **minutes** will it take the second car to catch up if the second car travels at 75 mph?
32	A right circular cylinder has height 4 units. The edge length of a cube is twice as long as the diameter of the cylinder. If the volume of the cube is 343 cubic units, what is the total surface area of the cylinder, in square units?
33	Let M and N both be counting numbers less than 10, such that $M \quad N = 1$. Find the sum of all values of N for which $M^2 < N^3$.
34	The product of two 2-digit prime numbers is 6d99, where "d" stands for an unknown digit. What is the sum of the two prime numbers?
35	A 4-digit year number can be separated down the middle into two 2-digit parts. If the positive difference between the two parts will divide into either of them without remainder, the year is "smooth". For example, 2013 is not smooth because neither 20 nor 13 is divisible by 7, and 2020 is not smooth because division by 0 is not allowed. How many of the years 2001 through 2025 are smooth?
36	Cathy is choosing a passcode for her computer. If her passcode needs to be 4 characters in length and has to contain 2 letters and 2 digits, in any order, how many possible passcodes can she make?
37	A standard cubical die has the numbers erased from two of its faces, and is then rolled twice. The sum of all possible values for the sum of the two rolls is 45. Which two numbers were erased from the die?
38	George writes a geometric sequence for which the first two terms are 3, 6. Ariel writes an arithmetic sequence for which the first two terms are also 3, 6. The value of the nth term of George's sequence is 16 times the value of the nth term of Ariel's sequence. What is n?
39	Solve for y and give your answer in standard scientific notation: $\left(4.8\cdot10^{7}\right)\left(7\cdot10^{-2}\right)\left(y\right)=\left(3.5\cdot10^{-4}\right)\left(1.2\cdot10^{3}\right)$
40	Jayze reads at a constant speed of N pages per hour, where N is a counting number. If Jayze finishes a 321-page book during the sixth hour after starting it, how many possible values could N have?

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Team Multiple Choice Contest

USE THIS INFORMATION TO ANSWER QUESTIONS 1 - 4.

The table below describes the relative probabilities of finding a vein of a certain material in a mine per day of mining, and average vein sizes for each material. Assume that it is impossible to find multiple veins in a single day.

Material	Probability	Average vein size (kilograms)	Sale price per kilogram
Iron	0.11	17	$80
Silver	0.04	7	$1100
Coal	0.16	12	$95
Sodium	0.13	8	$12
Zirconium	0.06	6	$180
Clay	0.24	7	$40
Spinel	0.11	0.4	$15

1 What is the probability that none of the above materials are found in one day of mining?

A) 0.05 B) 0.15 C) 0.23 D) 0.26 E) Answer not given.

2 Coal, clay, and spinel are not metal, but all other materials on the list are metals. What is the probability that in one day of mining no metal is found?

A) 0.15 B) 0.19 C) 0.31 D) 0.34 E) Answer not given.

3 Over the course of one week, 2 veins of iron, 1 vein of zirconium, and 1 vein of clay were mined. If each vein was the average size, how much money did that week's mining bring in?

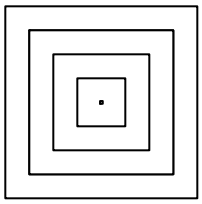
A) $1920 B) $3760 C) $4080 D) $4440 E) Answer not given.

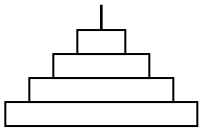
4 After a long period of mining, which material is predicted to be found in greatest quantity?

A) Coal B) Iron C) Clay D) Spinel E) Answer not given.

USE THIS INFORMATION TO ANSWER QUESTIONS 5-7.

A pyramid is shown below from the top view (left figure) and side view (right figure). The pyramid's base has a side length of 8 meters, and each level of the pyramid has a side length 2 meters shorter than the level below. On the top level of the pyramid is a pole, assumed to have zero width. Each level (and the pole) is 2 meters tall.





5 What is the sum of the lengths, in meters, of one side from each level of the pyramid?

A) 8 B) 14 C) 16 D) 20 E) Answer not given.

6 A determined ant starts on the ground at the middle of one side of the pyramid's base and travels in a straight line to the top of the pole on the top level of the pyramid. How many meters did the ant travel?

A) 8 B) 10 C) 12 D) 14 E) Answer not given.

7 If each of the pyramid's levels were placed side-by-side on the ground, what would be the area of the top of the resultant block, in square meters?

A) 64 B) 100 C) 120 D) 204 E) Answer not given.

USE THIS INFORMATION TO ANSWER QUESTIONS 8 - 10.

A painter has a paint base to which one or more dyes can be applied. However, dyes, if used, must be applied to the base in a certain order. For instance, black dye can be applied at any time, but no other dye can be applied after black. The following table gives the allowable order, where a dye cannot be applied after a dye of equal or higher order.

Color:	White	Yellow	Orange	Red	Green	Blue	Violet	Indigo	Black
Order:	1	2	3	4	4	5	6	7	8

8 The painter wishes to use orange, violet, and white dyes on the same base. If she ignores the instructions above and applies the dyes at random, what is the probability that the result is dyed correctly?

A) 1/3 B) 1/6 C) 1/7 D) 1/8 E) Answer not given.

9 Which two of the above dyes can never be applied to the same product base?

A) Red & Green B) Orange & Yellow C) Red & Violet D) White & Black
E) Answer not given.

10 Following instructions, how many 3-dye combinations can the painter make?

A) 210 B) 84 C) 56 D) 35 E) Answer not given.

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Team Contest

1	To go visit his brother, Mitchell drove 8 hours per day for three days. If he drove at a rate of a mile a minute, how many miles did he drive in all?
2	When 2013 is multiplied by itself, how many digits will the product have?
3	Harold was hopping mad. He hopped all the way from the goal line to the middle of a football field, a distance of 50 yards, in 120 hops. What was the average length in **inches** of Harold's hops? If your answer is not a whole number, give it as a decimal.
4	Four different numbers (A, B, C, and D) are chosen from the following list: 2, 3, 5, 9, 12, 15. In simplest fraction form, what is the smallest possible positive value of $\frac{A-B}{C-D}$?
5	Let N_6 represent the 'sixifier' of the number N, such that $N+N_6=6$. Find the product of 8_6 and $(-3)_6$.
6	If Lynn has 18 more dollars than Norah, and Norah has 71 fewer dollars than May, find the positive difference, in dollars, between Lynn's money and May's money. (To find the positive difference, subtract the smaller number from the larger number.)
7	A palindrome is a counting number that reads the same when its digits are reversed. When two 3-digit palindromes are added together, their sum is one thousand, one hundred. What is the smallest possible positive difference between the two added palindromes?
8	I am thinking of a counting number that is a multiple of 5, but not of 2 or of 3. It has either 2 digits or 3 digits, and no digit is greater than 5. How many numbers could I be thinking of?
9	For her birthday, Ruthie got 4 math books and some other books, all different. From these, she chooses 2 math books and one other book to take on vacation. There are 30 different sets of books Ruthie could choose. How many books in all did she get for her birthday?
10	A "twin prime pair" is a set of two prime numbers that differ by 2. The prime number 5 is a member of two different twin prime pairs (3 & 5, and 5 & 7). How many prime numbers less than 200 (including 5) are members of two different twin prime pairs?

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Relay Contest

RELAYS - 5 minutes per relay – 4 problems per relay - 2 relays – 15% of team score

There is no talking during this event and you must always be facing forward. Person #1 will be given an answer sheet and will need to fill out the information at the top. The proctor will hand out a strip of paper to each person containing problem(s). These need to be face down on your desk until it is time for the relay to start. Person #1 will have problem #1 on his/her paper. Person #2 will have problem #1 and #2 printed on his/her paper. Person #3 will have problem #2 and #3 on his/her paper and Person #4 will have problem #3 and #4 on his/her paper. Once the relay begins, everyone may turn over their strip of paper and begin working. You may write on the strip of paper to come up with answers to the problems on your strip of paper. However, when person #1 figures out his/her problem, he/she will record ***ONLY his/her final answer*** *on the answer sheet and pass only the answer sheet back to the person #2. Person #2 has the option of changing Person #1's answer if he/she wants by crossing it out and putting a new answer. Once Person #2 records at least an answer for problem #2 on the answer sheet, he/she passes only the answer sheet behind to Person #3. This continues until person #4 puts an answer on the answer sheet and gives it to the proctor. A correct answer for problem #1, #2 and #3 is worth 1 point each. A correct answer from problem #4 is worth 2 points making each relay worth 5 points. You will see the expression* ***TNYWG*** [Proctor: write this on the board] *which means: "the number you will get". This is where you insert your teammate's answer into the new problem that you have on your paper so you can finish solving it. Once the relay begins, turn over your strip of paper and* ***make sure you have the right person number****. Each teammate has the option of changing any answers on the answer sheet when they have it in their possession, but once it is passed back, they will not see the answer sheet again. Remember, no talking and remain facing forward to avoid being disqualified!*

	Practice Relay	Answer
Question 1	What is the sum of twelve and four?	16
Question 2	What is TNYWG divided by eight?	2
Question 3	What is TNYWG to the TNYWGth power?	4
Question 4	What is the TNYWGth root of 81?	3
	Relay #1	
Question 1	Bessie purchased a coat for 30% <u>off</u> the original price of $20. What is the new price, in dollars?	[$]14
Question 2	Sally ran for 30 minutes at TNYWG miles per hour. How many miles did she run?	7 [miles]
Question 3	Joe is going to cut a board into "n" pieces of equal length with TNYWG cuts. How many pieces will he have?	8 [pieces]
Question 4	Harold drove half way to work and realized he had forgotten his calculator so he drove home and got it and then drove to work. He drove a total of TNYWG miles. How many miles had he driven when he realized he had forgotten his calculator?	2 [miles]
	Relay #2	
Question 1	What is the diameter of a circle with radius 2?	4 [units]
Question 2	What is the area of a square with side length TNYWG?	16 [square units]
Question 3	Two times TNYWG can be represented in the form n^x where both n and x are counting numbers larger than 1. What is the sum of n and x?	7
Question 4	If x! ends in TNYWG zeroes, what is the smallest possible value of x?	30

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COLLEGE KNOWLEDGE BOWL ROUND #1 - SET 1

#	Problem	Answer
1	Find the sum of 17, negative 3, and negative 11.	3
2	In cubic units, what is the volume of a cube with side length 6 units?	216 [cubic units]
3	Rancher Ada has one hundred cows numbered 1 through 100. Rancher Helen bought all the cows numbered 33 through 55, inclusive. How many cows did Helen buy?	23 [cows]
4	How many distinct positive factors does 18 have?	6 [factors]
5	If you spend twelve and a half hours of your day sleeping, then how many MINUTES in that day are you awake?	690 [minutes]
6	A circle has area 49 pi square inches. What is the number of inches in its diameter?	14 [inches]
7	What is the sum of the first 11 odd counting numbers?	121
8	An eight-by-eight checkerboard has alternating black and white unit squares. A square piece having an area of one-fourth of the checkerboard is removed. How many black unit squares remain?	24 [squares]
9	Mary is 5 feet 8 inches tall. How many INCHES tall is Mary?	68 [inches]
10	A cylinder of diameter 8 meters and height 12 meters is filled with liquid at a rate of 6 pi cubic meters per hour. How many hours does it take for the cylinder to fill?	32 [hours]

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COLLEGE KNOWLEDGE BOWL ROUND #2 - SET 2

#	Problem	Answer
1	How many faces does a square pyramid have?	5 [faces]
2	How many times does the digit 5 appear in prime numbers less than 100?	3 [times]
3	Carl buys 17 shirts costing 3 dollars each. He wants each shirt to have a logo on it. It costs 6 dollars per shirt to add a logo. How many dollars does Carl have to pay for the shirts with logos?	153 [dollars]
4	Completely reduce the following fraction: three hundred seventy-eight over two thousand one hundred forty-two.	3/17 [3 over 17]
5	What is the positive difference between thirty-one and the product of nineteen and eight?	121
6	A taxi driver charges a flat fee of 5 dollars per trip, plus 30 cents for each one-twelfth of a mile. What is the cost, in dollars, of a trip of four-and-a-half miles?	[$]21.20 [or 21 dollars and 20 cents]
7	Some Mathletes sell donuts for a fund-raiser. They bought eight dozen donuts for forty-eight dollars and sold all of them for ninety-six dollars. On average, how many CENTS profit was made on each donut?	50 [cents]
8	A spider climbs a 12-meter wall at a rate of 4 meters per day. Each night it rains and knocks the spider back down 2 meters. On what day does the spider reach the top of the wall?	[day] 5 or 5th [day]
9	What is five and four-ninths minus two and one half? Answer as a mixed number.	$2\frac{17}{18}$ [2 and 17 eighteenths or 2 and 17 over 18]
10	Phil has two shirts and three pair of pants that he only wears to his Monday through Friday job. An outfit is one shirt and one pair of pants. Phil wears a different outfit each day until he must repeat an outfit. If he starts work on Monday, on which day of the week will he first need to repeat an outfit?	Tuesday

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COLLEGE KNOWLEDGE BOWL ROUND #3 - SET 3

#	Problem	Answer
1	What is 14 times 98?	1372
2	What is the remainder when 7299 is divided by nine?	0 or none
3	If there are 20 birds and 15 dogs, what is the sum of the number of heads and legs?	135
4	It takes 12 minutes to pre-heat an oven before baking a pizza, but it takes a whole hour for the oven to get back to room temperature after turning it off. For this oven, heat is gained X times as fast as it is lost. What is X?	[X=] 5
5	A 27-year-old mother shares a birthday with her 5-year-old daughter. In how many years will the mother be 3 times as old as her daughter?	6 [years]
6	A rectangle has side lengths of 5 inches and 12 inches. What is the length in inches of one of its diagonals?	13 [inches]
7	A circular target is composed of three concentric circles with radii 1, 2, and 3 centimeters. The innermost section and the outermost sections are painted white, and the middle section is red. What fraction of the target is red?	1/3
8	What is the time 5400 seconds before 12:45 PM?	11:15 AM
9	Courtney has 36 cents with no two coins being the same. How many coins does she have?	3 [coins]
10	An oak tree drops 5 acorns on the first day of fall. On the second day, it drops 7. On the third day it drops 10 acorns, and on the fourth day 14. How many acorns in all have dropped after the 7^{th} day if this pattern continues?	112 [acorns]

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COLLEGE KNOWLEDGE BOWL ROUND #4 - SET 4

#	Problem	Answer
1	What is 23 squared?	529
2	An scalene hexagon has an average side length of 3.6 inches. What is the perimeter of the hexagon in inches? Answer as a decimal number of inches.	21.6 [inches]
3	How many ways can the letters of the word "DIVIDE" (spelled D-I-V-I-D-E) be arranged?	180 [ways]
4	What is three to the sixth power?	729
5	The perimeter of an equilateral triangle is 42 inches. What is the combined length in inches of two of its sides?	28 [inches]
6	The scale of a map is: three-fourths of an inch equals 7 miles. If the distance on the map between two towns is 9 inches, what is the actual distance between the towns, in miles?	84 [miles]
7	Brenda has a rectangular garden that is 10 feet by 12 feet with a 3-foot wide rectangular walkway around the outside. How many square feet is the walkway?	168 [square feet]
8	One side of a balance scale holds a full bale of hay, which is balanced by half a bale of hay and a fifty-pound bag of salt on the other side of the scale. How many pounds does a full bale of hay weigh?	100 [pounds]
9	What is the sum of the least common multiple and the greatest common factor of 18 and 24?	78
10	A piece of paper is five hundredths of an inch thick. Every time you fold the paper, its thickness is doubled. What is the minimum whole number of folds it would take to make the paper at least a mile thick?	21 [folds]

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COLLEGE KNOWLEDGE BOWL ROUND #5 - SET 5

#	Problem	Answer
1	Bill bought 12 apples for thirty-six dollars. Abby bought 3 apples at the same unit cost as Bill's apples. How many dollars did Abby pay for her apples?	9 [dollars]
2	The regular price for a skirt is $30. How many dollars does the skirt cost if it is on sale for 10 percent off?	27 [dollars]
3	How many counting numbers from 10 through 20 (inclusive) are not divisible by 3?	8 [counting numbers]
4	Patricia picked 70 apples from each of 8 trees. How many apples did she pick?	560 [apples]
5	James is 8 years old. Tom is 7 years older than James, and Matt is 2 years younger than Tom. How many years old is Matt?	13 [years]
6	The gas tank on a car holds 10 gallons, and is three-fourths of the way full. How much, in dollars, will it cost to finishing filling the tank if gas costs 3 dollars a gallon?	[$] 7.50 [or 7 dollars and 50 cents]
7	Each side (face) of a cardboard box is a rectangle. The box is 14 inches long and 6 inches high. The volume of the box is 336 cubic inches. What is the width of the box, in inches?	4 [inches]
8	Chairs have 4 legs each and stools have 3 legs each. If there are 19 chairs and stools in all, with a total of 63 legs, how many stools are there?	13 [stools]
9	Will has 9 quarters, 13 dimes, 9 nickels, and 6 pennies. He spends two dollars and fifty-one cents. How much, in dollars, does he have left?	[$]1.55 [or 1 dollar and 55 cents]
10	The probability that a particular event will occur is the fraction N over eleven. The probability that it will <u>not</u> occur is the quantity (N minus one), over eleven. As a reduced fraction, what is the probability that the event will occur?	6/11 [or 6 over 11]

"Math is Cool" Championships – 1012-13

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6th Grade – February 8, 2013

COLLEGE KNOWLEDGE BOWL ROUND #6 - SET 6

#	Problem	Answer
1	Kim finished three-fifths of a job in thirty-six minutes. At this rate, how many more minutes will it take her to complete the rest of the job?	24 [minutes]
2	What is one less than the square of 18?	323
3	As a reduced fraction, what is one-fourth divided by three-halves?	1/6
4	How many diagonals can be drawn in a convex octagon?	20 [diagonals]
5	What is the number of square units in the surface area of a rectangular prism with edge lengths 7, 12, and 18?	852 [square units]
6	A triangle has one angle of 65 degrees and another angle of 89 degrees. What is the degree measure of the missing angle?	26 [degrees]
7	What is the 10^{th} term in the arithmetic sequence 4, 9, 14 and so on?	49
8	What counting number between 60 and 70 has a remainder of 13 when divided by 17?	64
9	Andrew's electric bill was $504 for the month of December and $476 for the month of January. His heater was responsible for three-fourths of his electric bill. How many dollars did Andrew spend on the rest of his electric bill for these two months?	245 [dollars]
10	How many times would one have to roll a fair four-sided die to have less than a 5% chance of rolling all the same number?	4 [times]

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COLLEGE KNOWLEDGE BOWL ROUND - EXTRA

#	Problem	Answer
1	What is the smallest counting number you could add to 319 so that the sum would be divisible by 6?	5
2	A certain radioactive substance decays at a rate such that its mass halves every twelve months. After three years, how many kilograms are left of a 256-kilogram sample of this substance?	32 [kilograms]
3	What is the smallest prime number larger than 120?	127

Final Score:
KEY

First Score
(out of 8)

"Math is Cool" Championships – 2012-13

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Name_____Team #_____

Room #_____

School Name _____ Proctor Name_____

Mental Math Contest

MENTAL MATH - 30 seconds per question – 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.*

DO NOT WRITE IN SHADED REGIONS

	Answer	1 or 0	1 or 0
1	31 [tickets]		
2	98 [sq ft]		
3	7/12		
4	90 [sq cm]		
5	960		
6	1/4		
7	150[°]		
8	6 [sums]		

"Math is Cool" Championships – 2012-13

6th Grade – February 8, 2013

Final Score:
KEY

School Name_____Team #_____

First Score
(out of 20)

Proctor Name_____Room #_____

TEAM 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. When you are prompted to begin, tear off the colored sheet, pass out a copy of the test to each team member, and begin testing. Since this is a multiple choice test, ONLY a letter response should be listed as an answer on the answer sheet.

DO NOT WRITE IN SHADED REGIONS

	Answer	-1, 0 or 2	-1, 0 or 2
1	B		
2	E(0.66)		
3	C		
4	A		
5	D		
6	D		
7	C		
8	B		
9	A		
10	E (77)		

"Math is Cool" Championships – 2012-13

6th Grade – February 8, 2013

Final Score:

KEY

First Score

(out of 10)

School Name_____Team #_____

Proctor Name_____Room #_____

TEAM TEST - 15 minutes – 10 problems – 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 colored answer sheet.*

DO NOT WRITE IN SHADED REGIONS

	Answer	1 or 0	1 or 0
1	1440 [miles]		
2	7 [digits]		
3	15 [inches]		
4	$\frac{1}{10}$		
5	-18		
6	[$]53		
7	10		
8	23 [numbers]		
9	9 [books]		
10	1 [prime number]		

"Math is Cool" Championships -- 2012-13

KEY

6th Grade – February 8, 2013

School:_____Team #_____

Proctor: _____ Room #_____

PRACTICE RELAY

Answer for person # 1	Answer for person # 2	Answer for person # 3	Answer for person # 4
16	**2**	**4**	**3**
1 or 0	1 or 0	1 or 0	2 or 0

RELAY # 1

Answer for person # 1	Answer for person # 2	Answer for person # 3	Answer for person # 4
[$]14	**7[miles]**	**8[pieces]**	**2[miles]**
1 or 0	1 or 0	1 or 0	2 or 0

RELAY # 2

Answer for person # 1	Answer for person # 2	Answer for person # 3	Answer for person # 4
4[units]	**16[square units]**	**7**	**30**
1 or 0	1 or 0	1 or 0	2 or 0

Final Score:

First Score
(out of 8)

"Math is Cool" Championships – 2012-13

Sponsored by:

6th Grade – February 8, 2013

Name_____Team #_____

Room #_____

School Name _____ Proctor Name_____

Mental Math Contest

MENTAL MATH - 30 seconds per question – 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.*

DO NOT WRITE IN SHADED REGIONS

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

"Math is Cool" Championships – 2012-13

6th Grade – February 8, 2013

School Name_____Team #_____

Proctor Name_____Room #_____

Final Score:

First Score
(out of 20)

TEAM 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. When you are prompted to begin, tear off the colored sheet, pass out a copy of the test to each team member, and begin testing. Since this is a multiple choice test, ONLY a letter response should be listed as an answer on the answer sheet.

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 – 2012-13

6th Grade – February 8, 2013

Final Score:

School Name_____Team #_____

First Score
(out of 10)

Proctor Name_____Room #_____

TEAM TEST - 15 minutes – 10 problems – 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 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			

"Math is Cool" Championships – 2012-13

February 8, 2013 – 6th Grade

Final Score: 1-15	Final Score: 16-30	Final Score: 31-40
KEY	KEY	KEY

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

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

DO NOT WRITE IN SHADED REGIONS

	Answer	1 or 0	1 or 0
1	5 [buses]		
2	15[degrees]		
3	12 [sides]		
4	1841		
5	4 1/2		
6	1 [pencil]		
7	85		
8	36 [seats]		
9	130 [miles]		
10	3		
11	1/2		
12	6		
13	blue		
14	4		
15	210		
1-15 TOTAL:			

	Answer	1 or 0	1 or 0
16	1		
17	21/2 [inches]		
18	6		
19	27 [marbles]		
20	36 [handshakes]		
21	3200 [sq ft]		
22	16 [horses]		
23	24 [people]		
24	140		
25	35 [minutes]		
26	48 [cubes]		
27	54 [square meters]		
28	75		
29	[$]27.50		
30	1524 [dollars] or [$]1524		
16-30 TOTAL:			

	Answer	1 or 0	1 or 0
31	120 [minutes]		
32	$161\pi/8$ [sq units]		
33	33#		
34	164		
35	9 [years]		
36	405600 [passcodes]		
37	4&6 [either order]		
38	[n=] 8		
39	[y=] $1.25 \cdot 10^{-7}$ or 1.25×10^{-7}		
40	11 [values]		
31-40 TOTAL:			

6th Grade

Final Score: 1-15	Final Score: 16-30	Final Score: 31-40

"Math is Cool" Championships – 2012-13

February 8, 2013 – 6th Grade

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

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

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:			

6th Grade