"Math is Cool" Masters – 2015-16

May 21, 2016

Total Correct

KEY

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

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

6th Grade Individual Contest – Score Sheet

DO NOT WRITE IN SHADED REGIONS

	Answer	1 or 0	1 or 0
1	30 [minutes]		
2	2		
3	30		
4	47		
5	25 [sq in]		
6	3 [people]		
7	6		
8	6		
9	[$] 2.96		
10	14		
11	$3\frac{1}{2}$ [inches]		
12	12		
13	11/12		
14	96		
15	1/21		
1-15 TOTAL:			

	Answer	1 or 0	1 or 0
16	475 [mL]		
17	45 [ounces]		
18	7		
19	[$] 4		
20	0		
21	4:20 PM		
22	100π [sq in]		
23	285 or 286 [complete chunks of wood]		
24	150 [songs]		
25	45 [°] or 72 [°] (either one)		
26	8/125		
27	8		
28	$\frac{9r}{5}$		
29	35 [%]		
30	6 [times]		
16-30 TOTAL:			

	Answer	1 or 0	1 or 0
31	[$] 2		
32	28 [perfect squares]		
33	54		
34	100.625 [°]		
35	6 [times]		
36	2/11		
37	3 [tools]		
38	120 [times]		
39	$5\sqrt{41}$ *or* $\sqrt{1025}$ [ft]		
*40	435,000 [moons, planets, and stars]		
31-40 TOTAL:			

6th Grade

*3,000 [stars], 24,000 [planets], 408,000 [moons]

Total Correct

"Math is Cool" Masters – 2015-16

May 21, 2016

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

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

6th Grade 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:			

6th Grade

"Math is Cool" Masters – 2015-16

Sponsored by: Akzo Nobel

May 21, 2016

6th Grade 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. Bad sportsmanship may result in disqualification.*
- *Calculators or any other aids may not be used on any portion of this contest.*
- *Unless stated otherwise:*
  - *For problems dealing with money, a decimal answer should be given.*
  - *Express all rational, non-integer answers as reduced common fractions.*
- *For fifth and sixth grade, all fractions and ratios must be reduced.*
- *Counting or natural numbers refer to the numbers 1,2,3,4 and so on and do NOT include 0.*
- *Units are not necessary unless it is a problem that deals with time and, in that case, am or pm is needed. 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 filled out at the top of the sheet.*
- *Tests will be scored as a 0 if answers are not recorded correctly on the answer sheets.*
- *Blank answer sheets and answer sheets with no name will also 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

You may NOT be seated next to anyone from your school. If you are MOVE NOW to avoid being disqualified! 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.*

"Math is Cool" Masters – 2015-16

Sponsored by: Akzo Nobel

6th Grade – May 21, 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

You may NOT be seated next to anyone from your school. If you are MOVE NOW to avoid being disqualified! 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	The sum of Amanda's and Caleb's age is 72 years. What will the sum of their ages be fifteen years from now?
2	John will get a golden star if he gets an average of 90 on his history tests. He received an 84 on the first history test. What is the lowest score he can get on the second test to get a golden star?
3	The number 195 can be written as a sum of 3 consecutive integers. What integer is the largest of those 3 integers?
4	What are the next two numbers in the pattern: 100, 85, 70, 55,…?
5	Dan and Ethan stand at the same point. Dan runs north 15 feet and Ethan runs east 20 feet. What is the distance between Dan and Ethan?
6	How many zeros are at the end of 10 x 9 x 8 x 7 x 6 x 5 x 4 x 3 x 2 x 1?
7	How many perfect squares are greater than 2 and less than 20?
8	If Manny flips a coin five times, what is the probability that he gets heads every time, expressed as a common fraction?

"Math is Cool" Masters – 2015-16

Sponsored by: Akzo Nobel

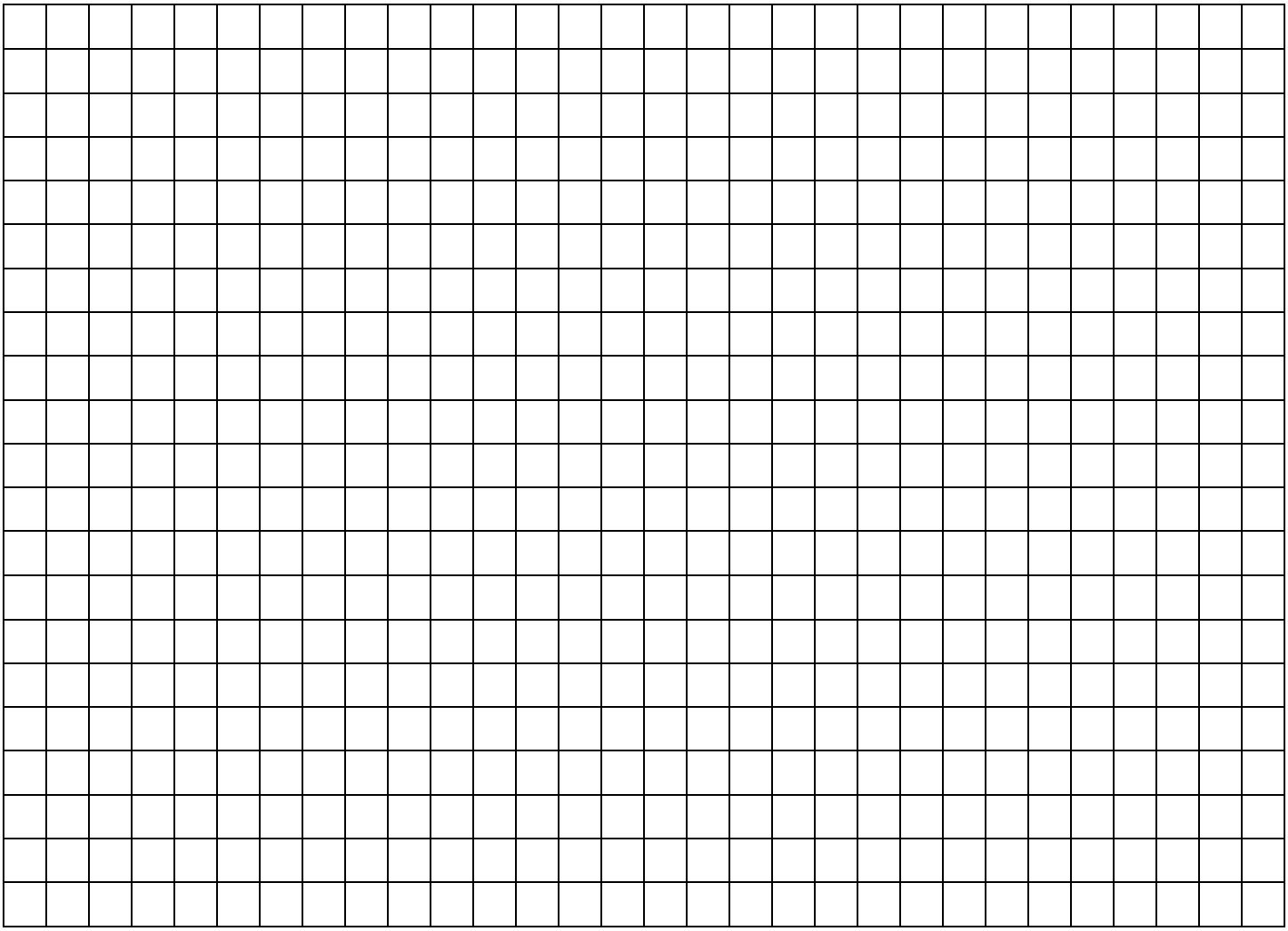
May 21, 2016

Individual Contest – 6th Grade

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.



"Math is Cool" Masters – 2015-16

Sponsored by: Akzo Nobel

6th Grade – May 21, 2016

Individual Contest

Record all answers on the colored cover sheet.

	Questions 1-30: 2 points each
1	If Mariana can run a mile in 6 minutes, how many minutes would it take her to run 5 miles?
2	What is the smallest prime number?
3	What is 15% of 200?
4	In math class, Diego created a "Fibby" sequence. In this sequence, each term after the first and second terms is the sum of the two preceding terms. If the first four terms of Diego's "Fibby" sequence are 3, 4, 7, and 11, what is the seventh term in his sequence?
5	What is the area, in square inches, of a square with side length 5 inches?
6	If Ash has a bike, then Chris has a bike. If Chris has a bike, then Jesse has a bike. If Ash has a bike, then how many people in this question have bikes?
7	There are 3 people in a line. If order matters, how many ways can they line up?
8	There are two numbers less than 10 such that their sum 11 is and their product is 30. What is the larger of the two numbers?
9	Together Yashvi and Tanuj want to buy movie tickets for both of them to see Frozen. Yashvi has 37 quarters, 22 dimes, and 8 nickels, while Tanuj has 1111 pennies. If each movie ticket costs $10.00, how much money, in dollars and cents, would Tanuj and Yashvi have left together after buying their tickets?
10	What is the mean of 15, 18, 17, 11, and 9?
11	A sphere has a diameter of 7 inches. As a mixed number, how long is its radius?
12	If $2^{24} = 4^x$, what is the value of x?
13	When two dice are rolled, what is the probability that their sum is greater than 3?
14	Jack and Allison are taking turns saying numbers. Jack starts with the number three, and then Allison multiplies it by two and says 6. Jack then multiplies that number by two and says the result, and so on. What is the third number that Allison says?
15	There are two pennies, two nickels, and three quarters on a table. If Jason draws two coins from the table at random, what is the probability that he has two cents?
16	Billy drinks 3 bottles of water every day. If he can drink 17,100 mL of water in 12 days, how many mL are in a bottle?
17	A cube has a volume of 16 in^3 and weighs 16 ounces. If a second cube has a volume of 45 in^3, how much does the second cube weigh, in ounces?
18	How many prime numbers are there between 20 and 50?
19	Derek spends $45 at the store buying some chips and jugs of juice. Derek buys 10 jugs of juice and 5 bags of chips. If each bag of chips costs $3 less than a jug of juice, how many dollars does a jug of juice cost?

20	How many prime numbers between 11 and 100 are divisible by 3?
21	A lollipop-eating contest began at 1:00 p.m. and ended 200 minutes later. At what time did the contest end?
22	What is the area, in square inches, of a circle whose radius is 10 inches? Express your answer as a number times π.
23	If a woodchuck could chuck wood, it could chuck 3 chunks of wood in 12 days. Charles is a woodchuck that can chuck wood. How many complete chunks of wood could Charles chuck if he chucks wood for 3 years and 48 days?
24	Alex has 60 dollars to spend on music. Each song costs $0.40. How many songs can Alex buy?
25	An isosceles triangle has an angle that is twice as large as one of its other angles. What is the measure of the third angle? Express your answer in degrees.
26	Jerry rolls a 15-sided die 3 times. What is the probability that he will roll three prime numbers?
27	How many numbers under 100 are multiples of two and three but not multiples of 12?
28	The radius of a circle with area 25 is r. What is the radius of a circle with area 81, in terms of r?
29	Hunter Zolomon took a lie detector test. Barry Allen from Earth 2 gave him the lie detector test and asked him 20 questions. The lie detector said that Hunter lied in 7 of the questions that were asked. What percent of Zolomon's answers were lies?
30	Alfred was 35 years old when he met the 8 year old Billy. Now that Alfred is 98 years old, how many times has his age been in the reverse order of Billy's since they met? E.g. When Alfred was 41, Billy was 14.

Challenge Questions: 3 points each	
31	If a game machine gives the user $5 20% of the time and $0 the other 80% of the time, what is the expected value of my winnings, in dollars, if I play the game twice?
32	How many perfect squares between 50 and 5000 start or end with a 1?
33	A right triangle has side lengths of 3, 4, and 5. Melanie found a similar triangle which has a perimeter of 36. What is the area of Melanie's triangle?
34	What is the measure, as a decimal number of degrees, of the smallest angle between any two of the hour, minute, and second hands on a 12-hour analog clock when it reads 45 seconds past 1:23?
35	Ellen can bounce a ball 30 times in 20 seconds. George can bounce a ball 35 times in 25 seconds. How many more times does Ellen bounce a ball in a minute compared to George?
36	What is the slope of a line that passes through points (3,6) and (14,8)?
37	A chair has 4 legs, a stool has 3 legs and a table has 1 leg. At a birthday party, there are 4 chairs per table and a total of 18 pieces of furniture. One of the children counts 60 legs total. How many stools are there?
38	How many times in a day is the "number" on a digital 12-hour clock equal to a multiple of 12? E.g. at 1:20, the "number" is 120, and that is a multiple of 12.
39	Leslie is measuring the length of a ladder that's leaning against a 20ft wall. She knows the distance between the bottom of the ladder and the bottom of the wall is 25ft. How many feet long is the ladder?
40	Mort the Alien eats 1,500 solar systems every day. If there is 1 star per solar system, 8 planets for every star, and 17 moons for each planet, how many moons, planets, and stars does Mort eat in 2 days?

"Math is Cool" Masters – 2015-16

Sponsored by: Akzo Nobel

6th Grade – May 21, 2016

Team Multiple Choice Contest

Use the following to answer questions 1-3.

At Galactic Pictures Washington (GPW) theme park, the Snak Shak menu is as follows:

Item	Price		Item	Price
Snacks			**Desserts**	
Bag of Chips	$3.25		Ice Cream Bar	$4.25
Piece of Fruit	$2.75		Bag of Candy	$3.50
Entrees			**Drinks**	
Burger	$9.00		Regular	$5.75
Pizza Slice	$7.75		The Chug-A-Lug*	$24.00
Super Salad	$11.50			

1 If I order a snack, a entrée, a dessert, and a drink, what is the least money I could spend?

A) $18.00 B) $19.75 C) $22.25 D) $23.50 E) Answer not given.

2 If a family of five orders five different items to share, what is the least money they could spend?

A) $13.75 B) $16.25 C) $19.50 D) $22.00 E) Answer not given.

3 The Chug-A-Lug is a giant plastic container of soda-pop, and it is refillable throughout your entire vacation at GSW. If Susie buys a Chug-A-Lug on the beginning of three days in GSW and fills it five times each day (including the time she bought it), how much money will she save versus buying five drinks a day?

A) $62.25 B) $73.75 C) $81.25 D) $86.75 E) Answer not given.

Use the following for questions 4-7:

In the Mathtathlon, students from three schools participated in four different events. The chart below shows how many students from each school participated in each event, as well as the high and average score in each event.

Event	School A	School B	School C	High Score	Avg. Score
Written	25	24	23	91	55
Relay	20	21	22	82	62
Duel	19	18	17	93	72
Hunt	14	15	16	87	73

4 If students can participate in multiple events, what is the minimum number of students who could have participated in the Mathtathlon?

A) 72 B) 45 C) 25 D) 14 E) Answer not given.

5 What was the total number of points scored by all contestants in the Hunt?

A) 3915 B) 3285 C) 1392 D) 1022 E) Answer not given.

6 Which test was the hardest for the best competitors (had the lowest high score)?

A) Written B) Relay C) Duel D) Hunt E) Answer not given.

7 Which test was the easiest for everyone (had the highest average score)?

A) Written B) Relay C) Duel D) Hunt E) Answer not given.

Use the following for questions 8-10.

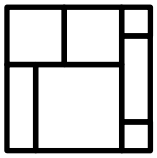
I can buy the following rectangular tiles, all of which are different shapes and have integer lengths and widths:

Tile	Length (in)	Width (in)	Perimeter (in)	Area (square inches)	Price ($)
A	1	1			0.25
B	3		12		2.50
C		2		4	0.75
D				3	0.75
E			10		1.00
F	1		6		0.50
G			10	6	1.75

8 What is the width, in inches, of Tile B?

A) 3 B) 4 C) 6 D) 9 E) Answer not given.

9 How much would it cost to buy the tiles for this 5" square mosaic (which is drawn to scale)?



A) $5.75 B) $6.00 C) $6.25 D) $6.50 E) Answer not given.

10 I'm making a very large mural; which tile should I use the most if I want to do it for as little money as possible?

A) A B) B C) C D) D E) Answer not given.

6th Grade

"Math is Cool" Masters – 2015-16

Sponsored by: Akzo Nobel

6th Grade – May 21, 2016
Team Contest

1	In the 18th century, a man named Leonhard Euler discovered that $\frac{1}{1^2}+\frac{1}{2^2}+\frac{1}{3^2}+\cdots=\frac{\pi^2}{6}$. From this, evaluate $\frac{1}{3^2}+\frac{1}{6^2}+\frac{1}{9^2}+\cdots$.
2	You wake up, look at a digital clock, and multiply the digits together. (For example, if the time is 3:31, your product is 3×3×1=9.) What is the largest product you can obtain?
3	Chris and Srinija are buying candy bars and chocolate. Chris buys 5 candy bars and 2 pieces of chocolate for $5.50. Srinija buys 2 candy bars and 5 pieces of chocolate for $3.25. What is the cost of buying 1 candy bar and 1 piece of chocolate?
4	How many sides does a regular polygon have if the sum of each of its interior angles equals 1080°?
5	An urn contains 5 red balls and 3 green balls. If a red ball is randomly picked, it is put back into the urn. If a green ball is randomly picked, it is NOT put back into the urn. What is the probability that after 2 turns, exactly 1 green ball has been set aside?
6	How many two-digit counting numbers are divisible by 3 but not divisible by 4?
7	An alien race uses more than ten fingers to count. An observer notices that 3*5 is a single digit number, but 5*7*8 is a three digit number. What was the three digit number, using the base notation that the aliens use?
8	Right now, Sadie is 4 years older than Roxy. 12 years ago, the ratio of Sadie's age to Roxy's age was 6:5. How old is Sadie right now?
9	A golfer sets up a drive on a perfectly straight hole. His drive goes 300 yards from the tee in total but ends up 84 yards to the left of the line from the tee to the hole. His second shot goes 91 yards in total and stops 9 feet past the hole on the line through the tee and the hole. How many feet is the hole from the tee?
10	I saw one dog pass by my house on the first day of school and one dog pass by on the second day of school. On the third day of school, two dogs passed by my house, followed by three dogs on the fourth day of school. On the fifth and sixth days of school I saw five and eight dogs, respectively, pass by my house. If this pattern in continued, how many dogs will pass by my house on the seventh day of school?

"Math is Cool" Masters – 2015-16

Sponsored by: Akzo Nobel

6th Grade – May 21, 2016

Robert Dirks' Relay Contest – Questions & Key

RELAYS - 5 minutes per relay – 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(s) and will need to fill out the top. The proctor will hand out a strip of paper to each person. These need to be face down on your desk until it is time for the relay to start. 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 your answer. However, when person #1 figures out his/her problem, he/she will record ***just his/her final answer*** *on the answer sheet and pass only the answer sheet back to the person behind. This continues until person #4 puts an answer on the answer sheet and gives it to the proctor. A correct answer from person #1, #2 and #3 is worth 1 point each. A correct answer from person #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 put your teammate's answer that they pass back to you, and then you should be able to solve your question. Once the relay begins, turn over your strip of paper and* ***make sure you have the right person number.*** *Remember, no talking and remain facing forward to avoid being disqualified!*

	Relay #1	**Answer**
Person 1	Zach can make 20 paper airplanes in 12 minutes. How many can he make in 1 hour?	100 [paper airplanes]
Person 2	Alex is getting ready to go to the movies with his best friend Caitlin. In order to impress Caitlin, Alex buys 2 ties, $\sqrt{TNYWG}$ shirts, and 5 pants. How many different combinations of outfits are possible?	100 [combinations]
Person 3	Rounded to the nearest whole number, what is the length, in meters, of the diagonal of a square with an area of TNYWG square meters?	14 [m]
Person 4	A recursive sequence is defined to have a first term of $z_1 = 100$ and subsequent terms defined by $z_n = 2z_{n-1} - 1$. What is the $\left(\frac{TNYWG}{2}\right)$th term of the sequence?	6,337
	Relay #2	**Answer**
Person 1	Find the value of x in the equation $5x + 9 = 64$.	11
Person 2	Clare has $37 and receives an allowance of $30 per month. How many dollars will Clare have in TNYWG years at this generous rate?	[$] 3,997[.00]
Person 3	How many positive counting numbers less than TNYWG are palindromes (look the same forwards and backwards, e.g. 3, 22, or 101)?	138 [palindromes]
Person 4	The data set of counting numbers {23, 4, 56, 7, 89, t, TNYWG} has a median greater than its mean. What is the largest possible value of t?	74

"Math is Cool" Masters – 2015-16

Sponsored by: Akzo Nobel

6th Grade – May 21, 2016

COLLEGE KNOWLEDGE BOWL ROUND #1 – SET 1

#	Problem	Answer
1	Tim is thirteen and Dan is seventeen. How old will Tim be when Dan is twenthy-three?	19 [years old]
2	The side length of a square is doubled. What is the ratio of the old area of the square to the new area of the square, expressed as a fraction?	$\frac{1}{4}$
3	A cube has edge lengths of five centimeters. Two faces of the cube are painted blue, one face is painted red, and the remaining faces are painted green. Find the surface area, in square centimeters, of the faces that are painted green or blue.	125 [cm^2]
4	What is the second largest two-digit prime number?	89
5	There are sixty kids at Camp Mathmania. If thirty-six of the kids play tennis and forty-eight of the kids play soccer, how many of the kids play both tennis and soccer if every kid plays at least one sport?	24 [kids]
6	Find the next number in the sequence beginning five, eight, twelve, seventeen, and twenty-three.	30
7	The post office charges fifty cents per pound when sending a package. Justin wants to send his books that weigh 4 pounds in a box that weighs half a pound. How much does he have to pay, in dollars and cents, to send this package?	2 dollars and 25 cents
8	Aliens use different operations than humans. If a certain alien operation, C-pound-B, is equal to B times the quantity C-plus-B, what is the value of 2-pound-6?	48
9	Evaluate X-squared-plus-three-X-plus-two when X equals negative one.	0
10	Ashley, with her one hundred words-per-minute typing speed, types what her professor says in lecture. Unfortunately, the professor speaks at a rate of two hundred words per minute. Two minutes into the lecture, what percentage of the professor's words has Ashley typed?	50 [%]

"Math is Cool" Masters – 2015-16

Sponsored by: Akzo Nobel

6th Grade – May 21, 2016

COLLEGE KNOWLEDGE BOWL ROUND #2 – SET 2

#	Problem	Answer
1	If five more than twice the magic number is equal to twenty minus the magic number, what is the magic number?	5
2	How many edges does a pentagonal prism have?	15 [edges]
3	A base angle of an isosceles triangle measures fifty-seven degrees. Find the measures, in degrees, of the other two angles.	57 & 66 (either order)
4	Mary's favorite numbers are prime numbers. John's favorite numbers are multiples of three. How many more favorite numbers does Mary have than Josh among the numbers from two to fifteen inclusive?	1 [favorite number]
5	Students at Fermat Middle School take English and/or Math, but must take at least one of them. seventy students take Math and fifty take English. There are one hundred students at the school. How many students take both classes?	20 [students]
6	Find the next term of the quadratic sequence beginning with two, six, twelve, and twenty.	30
7	A beginning piano student can play at most two notes at a time. If there are ten keys on a piano, how many different two-note "chords" can the student play?	45 [chords]
8	Angela's birthday is on a Friday this year. Crystal's birthday is one hundred days after Angela's birthday. What day of the week is Crystal's birthday on this year?	Sunday
9	Given that N equals five, find the result of eight times the quantity five-N-plus-thirteen.	304
10	Shannon has a stride of one-and-a half feet. Richard has a stride of zero-point-seven-five feet. If each of them takes ten steps, what is the distance between the two in inches?	90 [inches]

"Math is Cool" Masters – 2015-16

Sponsored by: Akzo Nobel

6th Grade – May 21, 2016

COLLEGE KNOWLEDGE BOWL ROUND #3 – SET 3

#	Problem	Answer
1	Bill can sharpen twelve pencils an hour with a handheld sharpener but he can sharpen thirty pencils an hour with an electric sharpener. If he uses the handheld sharpener for thirty minutes and the electric sharpener for forty minutes, how many pencils in total has he sharpened?	26 [pencils]
2	How many degrees are there in each interior angle of a regular polygon with six sides (a hexagon)?	120 [degrees]
3	A is the number of diagonals in a square. B is the number of sides in a hexagon. C is the radius of a circle with an area of one hundred twenty-one PI (pie) D is the number of sides in a pentagon. What is the average of A,B,C, and D?	6
4	Two distinct numbers are selected such that one is a cube, one is a square, and they differ by one. What is their product?	72
5	If Yashvi, Tanuj, Ava, and Brian sit in a row of 4 chairs in the movie theater, but Yashvi and Tanuj need to sit next to each other, how many different seating arrangements are possible?	12 [arrangements]
6	What is the sum of X and Y in the geometric sequence two, four, eight, X, Y?	48
7	Number X is odd and number Y is even. Is the product of X, Y, and the quantity X-plus-Y odd, even, or sometimes each of them?	even
8	A rectangle has an area of seven square units, and all of its side lengths are integer numbers of units. What is its perimeter, in units?	16 [units]
9	A spy has received a clue. It tells him to go north one block, west two blocks, south one block, east three blocks, north one block, west two blocks, south three blocks, and north one block. If he wants to take a shortcut, but can only go in directions of north, south, west and east, what direction(s) and how far does he need to walk?	one block west and 1 block south (either order)
10	Erica works from eight AM to one PM every Monday, Tuesday, and Thursday, and works two PM to five PM every Wednesday and Friday. How many hours does she work in two weeks?	42 [hours]

"Math is Cool" Masters – 2015-16

Sponsored by: Akzo Nobel

6th Grade – May 21, 2016

COLLEGE KNOWLEDGE BOWL ROUND #4 – SET 4

#	Problem	Answer
1	John has N pennies, two-N nickels, and two-N-plus-one dimes in his pocket. If the value of the coins is two dollars and twenty-seven cents, what is N?	7
2	Superman has to get to the top of a tree to save Mrs. Smith's cat. He is standing three feet away from the tree. The tree is four feet tall. How far will he have to fly straight to the cat?	5 [feet]
3	Two sides of a triangle have lengths six units and eight units. The third side's length is an integer number of units. It is a two-digit number and is divisible by three. What is the length of the third side, in units?	12 [units]
4	What are all the common factors of the two numbers six and twelve?	1, 2, 3, 6 (any order)
5	How many ways can three identical math books, two identical history books and one chemistry books be arranged on a shelf?	60 [ways]
6	An arithmetic sequence begins with one, five, nine, thirteen, X, Y, and Z. What is the value of X plus Y plus Z?	63
7	If the area of a square is one hundred forty-four square meters, what is the perimeter of the square in meters?	48 [m]
8	Marina thinks of a number. I think of a number. Marina tells me her number is not prime but is divisible by both three and seven. I tell her that my number has prime factors of three and seven. What is the smallest number both of us could be thinking about, if our numbers are actually the same?	21
9	If the operation X-ampersand-Y is defined to be Y-to-the-X-power minus X-to-the-Y-power, evaluate 2-ampersand-3.	1
10	Taylor's train leaves Brussels at one twenty-three PM. It takes forty-five minutes for the train to get from Brussels to Tamerind if the train does not stop. However, in the middle of the route, the train has a malfunction that has to be fixed. The train stops for seventeen minutes while the malfunction is being fixed. What time does the train arrive in Tamerind?	2:25 PM

"Math is Cool" Masters – 2015-16

Sponsored by: Akzo Nobel

6th Grade – May 21, 2016

COLLEGE KNOWLEDGE BOWL ROUND #5 – SET 5

#	Problem	Answer
1	Ann, Bob, and Cassie trade pencil parts after class. Ann offers Bob one piece of lead for two erasers, and Bob offers Cassie one eraser for three grips. How many grips must Cassie give Bob so he can get her four pieces of lead?	24 [grips]
2	When two identical equilateral triangles have two of their edges joined, the most specific name that can be applied to the resulting shape is "rhombus". If two identical squares have two of their edges joined, what is the most specific name that can be applied to the resulting shape?	rectangle
3	Chuanli, a farmer in China, wants to build a pen for his cats and dogs. He has forty feet of fencing and wants to make a rectangular pen with four sides. What is the largest area, in square feet, that he can contain?	100 [ft^2]
4	What is the largest common factor of forty, twenty-four, and seventy-two?	8
5	If I have six green socks and four red socks, what is the probability that I draw one green sock, then one red sock, then one green sock?	$\frac{1}{6}$
6	John knows that he has one pair of green socks, one pair of blue socks, and one pair of red socks in his drawer. But, the lights are off and he cannot distinguish between different colored socks. What is the fewest number of socks he must take out from the drawer to ensure that he picks at least one pair of matching socks?	4 [socks]
7	A suitably large apple pie is divided up among four children. Each child can cut the pie perfectly, and they will receive slices in alphabetical order. Abigail gets one-fourth of the pie, Brandon gets one-third of what remains after Abigail got her slice, and Cheryl gets half of what remains after Abigail and Brandon both got theirs. What fraction of the pie is left for Dolores?	$\frac{1}{4}$
8	Hong opens a bag of Skittles which contains four red, five purple, two orange, three yellow and six green Skittles. He only wants to eat the citrus Skittles (which are orange, yellow, and green). When he picks one at random, what is the probability that he does NOT eat a citrus Skittle?	$\frac{9}{20}$
9	Solve the following equation for X: seventeen-minus-X is equal to two-minus-three-X-plus-seven.	$x = -4$.
10	Chico went shopping and spent seventy-one dollars and twenty-three cents on clothes. He then bought a gift for a friend that cost eight dollars and ten cents. Lastly he bought some snacks for two dollars and twenty cents. How much did Chico spend total, in dollars and cents?	81 dollars and 53 cents

"Math is Cool" Masters – 2015-16

Sponsored by: Akzo Nobel

6th Grade – May 21, 2016

COLLEGE KNOWLEDGE BOWL ROUND #6 – SET 6

#	Problem	Answer
1	The sum of two distinct positive integers is thirteen and their product is thirty-six. What is the larger number subtracted from twice the smaller number?	-1 (negative 1)
2	Eddy wants to draw a circle inside a square. He makes his square six inches on a side, and then using a compass, draws a circle whose center is the same as the square's center and whose diameter is the same as the square's side length. What is the area of his circle? Give your answer in terms of PI (pie).	9π (9 pie)
3	What is the difference in degrees of the acute angle a minute and hour hands of a standard twelve-hour clock makes at two PM and the acute angle they make at one PM?	30
4	Albert's favorite number is forty-two. The teacher asked the class to write down the factors of their favorite numbers on a piece of paper. How many factors did Albert write down on the paper?	8 [factors]
5	You have three blue socks, seven red socks and four green socks in your drawer. What is the probability of getting two red socks when you pull out one sock and then pull out another sock?	$\frac{3}{13}$
6	Bernie's mother has five kids. The oldest is named One, the second oldest is named Two, the third oldest is named Three, and the fourth oldest is named Four. What is the youngest kid's name?	Bernie
7	Two cowboys agree to meet in the center of the town at noon. One is in the town, but the other must ride his horse there. If he leaves his ranch at 11 AM, his horse can travel ten miles an hour on a trot, and he has six miles to cover, how early, in minutes, will he be?	24 [minutes]
8	Jimmy got scores of ninety, eighty-eight, ninety-two, ninety-four, and eighty-six on his last five math tests. What was his average score over these five tests?	90
9	Two different integers satisfy the following: "When you square me, you also double me." What are the two integers?	0, 2 (either order)
10	Bryce wants to buy a toy for sixty-seven cents. He only has quarters, dimes and pennies. What is the least number of coins he has to use to pay the exact amount?	7 [coins]

"Math is Cool" Masters – 2015-16

Sponsored by: Akzo Nobel

6th Grade – May 21, 2016

COLLEGE KNOWLEDGE BOWL ROUND – EXTRA

#	Problem	Answer
1	What is one plus two plus three plus four plus five plus six plus seven plus eight plus nine plus ten?	55
2	What integer is even, but also prime?	2
3	Evaluate two thousand fifteen plus two thousand sixteen plus two thousand seventeen.	6,048
4	Victor drew a seventy-eight degree angle. Is the angle an obtuse, acute, or right angle?	Acute
5	Given the equation twenty-one-N-plus-two-equals-sixty-five, find N.	3
6	A spinner is divided into 4 colors: red, blue, green, and yellow. Red takes up ½ of the spinner. The rest of the colors each take up the same fraction of the spinner. What is the probability that the spinner does not land on yellow?	$\frac{5}{6}$
7	A person who weighs one hundred pounds on Earth weighs seventy pounds on a distant planet. How much would a three-hundred-pound person weigh on the planet?	210 [pounds]
8	A pig is trapped inside a pen that is in the shape of a circle. If the circle has a circumference of 6π yards, what is the pen's radius, in yards?	3 [yards]

Final Score:

KEY

(Out of 8)

"Math is Cool" Masters -- 2015-16

Student Name _____ Team #_____

School Name _____ Proctor Name_____ Room #_____

6th Grade <u>Mental Math</u> – 30 sec per question

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

You may NOT be seated next to anyone from your school. If you are MOVE NOW to avoid being disqualified! 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	102 [years]		
2	96		
3	66		
4	40 & 25 (this order only)		
5	25 [feet]		
6	2 [zeros]		
7	3 [perfect squares]		
8	$\frac{1}{32}$		

"Math is Cool" Masters – 2015-16

6th Grade – May 21, 2016

School Name_____Team #_____

Proctor Name _____Room #_____

Final Score: KEY
First Score (out of 20)

Team Multiple Choice Contest – 15 minutes – 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.***

Correct responses are worth 2 points, incorrect responses are worth -1 point and no response is 0 points.

DO NOT WRITE IN SHADED REGIONS

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

"Math is Cool" Masters – 2015-16

6th Grade – May 21, 2016

School Name_____Team #_____

Proctor Name_____Room #_____

Final Score:
KEY

First Score

(out of 10)

Team Contest – Score Sheet – 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 a 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	$\frac{\pi^2}{54}$		
2	405		
3	[$] 1.25 or 1 dollar and 25 cents		
4	8 [sides]		
5	$\frac{225}{448}$		
6	22 [two-digit counting numbers]		
7	$118_{[16]}$		
8	36 [years old]		
9	314 [feet]		
10	13 [dogs]		

"Math is Cool" Masters -- 2015-16

6th Grade – May 21, 2016

KEY

RELAY # 1

Answer for person # 1	Answer for person # 2	Answer for person # 3	Answer for person # 4
100 [paper airplanes]	**100 [combinations**	**14 [m]**	**6,337**
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
11	**[$] 3,997 [.00]**	**138 [palindromes]**	**74**
1 or 0	1 or 0	1 or 0	2 or 0

Final Score:
(Out of 8)

"Math is Cool" Masters -- 2015-16

Student Name _____ Team #_____

School Name _____ Proctor Name_____ Room #_____

6th Grade **Mental Math** – 30 sec per question

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

You may NOT be seated next to anyone from your school. If you are MOVE NOW to avoid being disqualified! 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" Masters – 2015-16

6th Grade – May 21, 2016

School Name_____Team #_____

Proctor Name _____Room #_____

Final Score:

First Score
(out of 20)

Team Multiple Choice Contest – 15 minutes – 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.***

Correct responses are worth 2 points, incorrect responses are worth -1 point and no response is 0 points.

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" Masters – 2015-16

6th Grade – May 21, 2016

School Name_____Team #_____

Proctor Name_____Room #_____

Final Score:

First Score
(out of 10)

Team Contest – Score Sheet – 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 a 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			