"Math is Cool" Masters – 2017-18

May 19, 2018

Total Correct
KEY

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

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

4th Grade Individual Contest – Score Sheet

DO NOT WRITE IN SHADED REGIONS

	Answer	1 or 0	1 or 0
1	11		
2	3 [lines]		
3	5		
4	5/11		
5	7:15 PM		
6	52 [sq in]		
7	39		
8	450 [days]		
9	can't tell		
10	34 [¢]		
11	11		
12	6 [primes]		
13	0		
14	[$] 5.25		
15	1.864		
1-15 TOTAL:			

	Answer	1 or 0	1 or 0
16	8 [cm]		
17	9 [multiples]		
18	Tuesday [or Tues]		
19	0, 4 [dimes] [either order]		
20	3		
21	64 [cm^2]		
22	110		
23	150 [°]		
24	14		
25	25 [mL]		
26	November [or Nov.]		
27	18 [burgers]		
28	12 [hours]		
29	192 [in^2]		
30	$3\frac{3}{5}$ [hr]		
16-30 TOTAL:			

	Answer	1 or 0	1 or 0
31	18		
32	89		
33	4 [cups]		
34	4344		
35	36		
36	1/5		
37	4 [tiles]		
38	53		
39	[$] 2.85		
40	192 [cubes]		
31-40 TOTAL:			

4th Grade

"Math is Cool" Masters – 2017-18

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May 19, 2018

4th 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 <u>all</u> 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.*

<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.*

"Math is Cool" Masters – 2017-18

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4th Grade – May 19, 2018

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	All of the flowers in Mary's yard are red and white. Mary has 16 red flowers and 23 white flowers. How many total flowers does Mary have in her yard?
2	John is 5 feet and 6 inches tall. In inches, how tall is John?
3	What is the product of 35 and 16?
4	What is the sum of two and three-fifth and eight and one-fifth?
5	My garden fence creates a regular hexagon with side lengths of 4 feet. If I reuse all of this fencing to make a new garden in the shape of an equilateral triangle, what is the length, in feet, of each side of the new garden?
6	If two percent of the 4000 students at Moses Lake High School volunteered at the Math is Cool tournament, how many students volunteered?
7	Mike has 84 pieces of candy. If he gives 5 pieces of candy to each of his friends and has 9 pieces left, how many friends did he give candy to?
8	How many positive numbers less than eighty are divisible by either 9 or 4 but not both?

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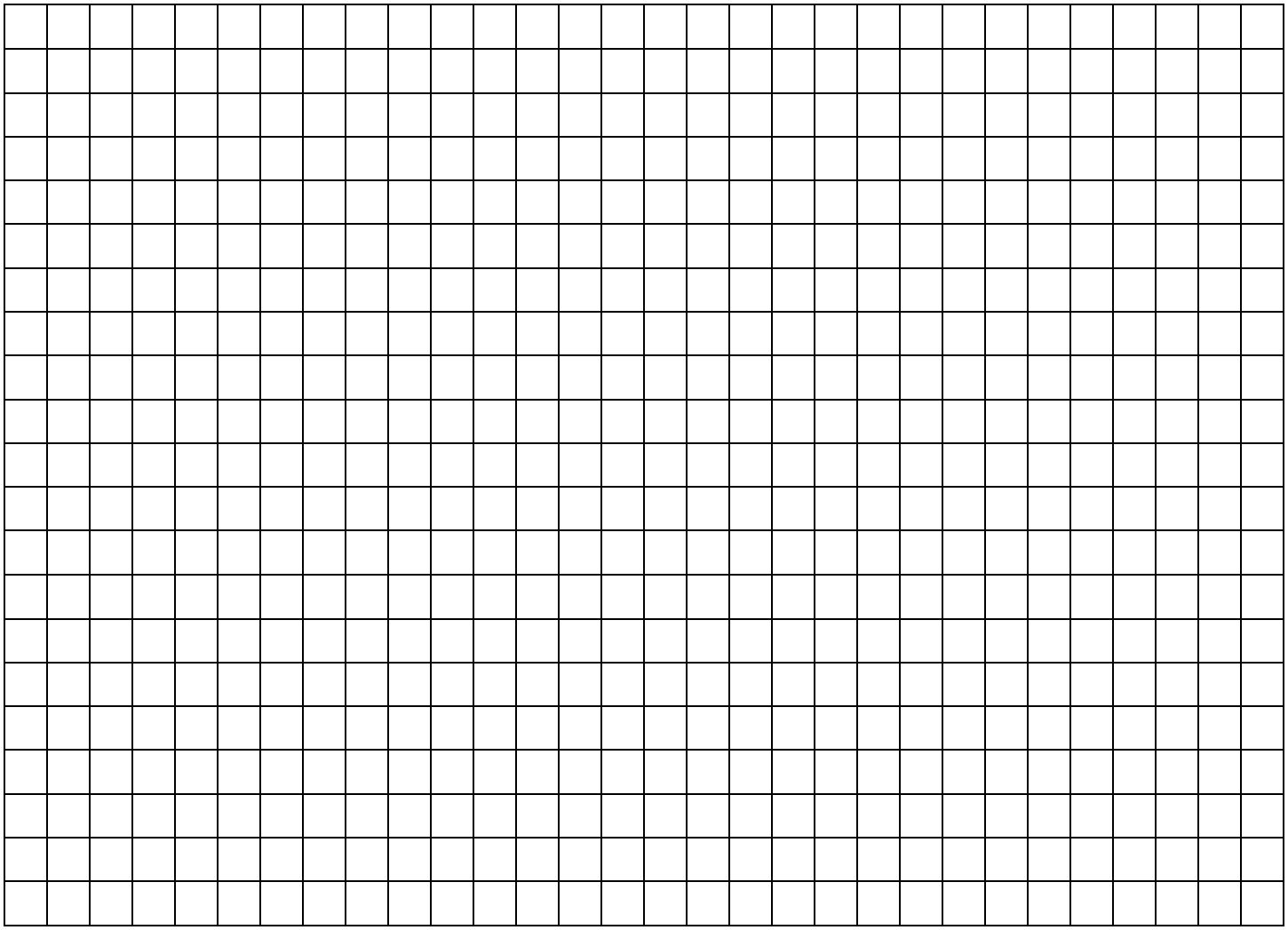
Individual Contest – 4th Grade

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.



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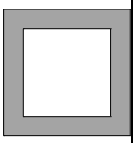
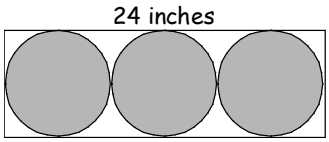
4th Grade – May 19, 2018

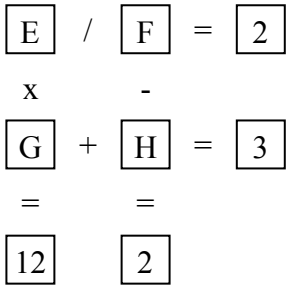
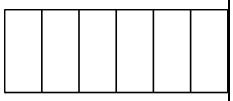
Individual Contest

Record all answers on the colored cover sheet.

	Questions 1-30: 2 points each
1	What is the sum of the digits of the year 2018?
2	A line of symmetry divides a figure into two equal halves, each half the reflection of the other. How many lines of symmetry does an equilateral triangle have?
3	When 7 is added to 18, the sum is how much less than 30?
4	Ethan has a jar with 2 red marbles, 4 blue marbles, and 5 yellow marbles. She takes out one marble at random. As a fraction, what is the probability that this marble is yellow?
5	What time will it be 50 minutes after 6:25 PM?
6	What is the area of a triangle with base 13 in and height 8 in?
7	Find the value of $4+5+6+7+8+9$
8	On the planet Pytha, the year is divided into 15 months, each with exactly 30 days. How many days are in a year on the planet Pytha?
9	I am thinking of three consecutive counting numbers between 100 and 200. ("Consecutive" means in a row, without skipping any.) Is their sum even or odd? If there is not enough information to be sure, answer "can't tell".
10	If three pencils cost 51¢ in all and each pencil costs the same amount, how many cents would two pencils cost?
11	What is the average (mean) of 10, 18, 7, and 9?
12	How many prime numbers are greater than 10 and less than 30?
13	If twice my number is equal to half my number, then what is my number?
14	Each chocolate chip cookie costs 75¢ and each vanilla cookie costs 50¢. Milly buys 3 chocolate chip cookies and 5 vanilla cookies and pays with a $10 bill. How much change (in dollars) should she get back?
15	Find the value of $3.09+0.034-1.26$, and give your answer as a decimal.
16	Mike has a piece of red rope candy that is 72 cm long. He marks 8 different places on the rope, then cuts through the rope at each of these places. On average, what is the length (in cm) of each resulting piece?
17	How many multiples of 5 are between 29 and 72?
18	March 3rd of a certain year is on a Thursday. On what day of the week will May 10th of that year fall? (Give the name of the day, not its number.)
19	Adam has 10 coins which have a total value of 78 cents. How many dimes could Adam have? If there is more than one possible answer, give all of them.

20	The fraction $\frac{1}{A}$ is less than $\frac{2}{5}$. What is the smallest whole number that A could be?
21	Four rectangular wooden pieces, each measuring 1 cm wide by 9 cm long, are arranged with no overlap to form a square picture frame, as shown (not to scale). What is the area, in square centimeters, of the largest picture that can fit completely within this frame? 
22	How much greater is the value of $5 \times 5 \times 5$ than the value of $5+5+5$?
23	The sum of the degree measures of the three angles of any triangle is exactly half the sum of the degree measures of the four angles of a rectangle. Two of the angles of a certain triangle have the same degree measure, which is 15°. What is the degree measure of the third angle of this triangle?
24	Find the value of $4(3+x)-(7+x)$ if $x=3$.
25	Water is trickling from a faucet at a rate of 2 mL per minute. If Betty holds an empty glass under the faucet, how many mL of water will she collect in 750 seconds?
26	This month is May. What month will it be 2010 months from now? Give the name of the month, not a number.
27	At Bert's Burger Barn, you can choose from white, whole wheat, or sesame buns, and from beef, chicken, or veggie patties. If a burger consists of one type of bun and either one patty or two patties of the same type, how many different burgers can you order?
28	Patrick and Patsy are jogging in the same direction along the same straight track. Patrick has a head start of 36 miles and jogs at 4 miles per hour. Patsy jogs at 7 miles per hour. Assuming they maintain these speeds without stopping, how many hours will it take Patsy to catch up with Patrick? 
29	In the figure at right, the three circles are the same size, and each touches its neighboring circle at a single point. The rectangle encloses them exactly. If the length of the rectangle is 24 inches as shown, find the number of square inches in the area of the rectangle.
30	In a "snow to shore" relay race, a canoeist covered her 12-mile portion of the route at an average speed of 5 miles per hour, and then passed the baton to a bicyclist who rode his 18 miles at 15 miles per hour. How many hours did it take them to cover these 30 miles? If your answer is not a whole number of hours, express it as a mixed number.

Challenge Questions: 3 points each	
31	What is my number if 17 more than my number is the same as 71 minus twice my number?
32	Two different counting numbers have the same remainder when divided by 7. (This remainder is not zero.) One of the numbers is a multiple of 6, and both numbers are less than 50. What is the largest possible sum of the two numbers?
33	Sharon had exactly enough sugar to bake 8 dozen cookies. But she decided to bake a cake first, using $1\frac{1}{2}$ cups of sugar from this supply. Afterwards, she had just exactly enough sugar left to bake 60 cookies. If each cookie uses the same amount of sugar, how many cups of sugar did Sharon have before baking the cake?

34	Stacey has 1000 sticks. She groups them into bundles of 6, and when she gets 6 such bundles, she ties them together to form a bindle. When she gets 6 bindles, she ties them together to form a bandle. When she has finished, Stacey has A bandles, I bindles that are not in bandles, U bundles that are not in bindles, and S sticks that are not in bundles. Write these four values in order (AIUS).
35	In the figure to the right, E-H are distinct counting numbers from 1 to 9 that satisfy the four equations (two across, two down). What is the product of E, F, G, and H? 
36	A small parking lot has spaces for 6 cars in a row, as shown. Three of the spaces, chosen at random, have cars parked in them. As a reduced (simplified) fraction, find the probability that the empty spaces are all next to each other. 
37	Sarah had a set of 100 square tiles, all the same size. She has now lost N of those tiles. It is now no longer possible for Sarah to lay out a set of squares made from her tiles so that all squares are different sizes and no tiles are left over. What is the smallest possible value of N?
38	When a certain counting number is divided by 9, the sum of the remainder and the quotient is 13. What is the smallest possible value of this number? (Remember that the divisor must be larger than the remainder.)
39	Lou bought five pieces of fruit. Each piece of fruit was either an apple, weighing $\frac{1}{2}$ pound, or an orange, weighing $\frac{3}{4}$ pound. The total weight of the fruit was a whole number of pounds. If apples cost 80¢ a pound and oranges cost $1.10 a pound, how much did Lou's fruit cost, as a decimal number of dollars?
40	Jan built a cube from unit cubes (each 1 by 1 by 1 unit). Ken took this cube apart, and used the unit cubes to build a rectangular solid that was the same height as Jan's cube but 2 units greater in width and 2 units less in length. Ken had 24 unit cubes left over. How many unit cubes did Ken use to build his figure?

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4th Grade – May 19, 2018

Team Multiple Choice Contest

USE THIS INFORMATION FOR PROBLEMS #1 to 3.

The middle school students in your town were surveyed and classified according to grade level and response to the question "how do you usually get to school"? The data is summarized in the two-way table below.

	Walk	Bus	Car	*Total*
6th Grade	30	120	65	*215*
7th Grade	25	170	25	*220*
8th Grade	40	130	41	*211*
Total	*95*	*420*	*131*	*646*

1. What is the probability that a randomly chosen student from this survey was a sixth grader?

A) 220/646 B) 95/646 C) 30/215 D) 215/646 E) 211/646

2. Which mode of transportation had the lowest average number of students?

A) Car B) Walk C) Bus D) None of the above

3. What is the probability that a randomly chosen 8th grader walks to school? Leave fractions un-reduced.

A) 40/646 B) 40/95 C) 40/211 D) 95/211 E) None of the above

4. When a fair six-sided die is rolled, what is the probability that it shows a number that is a factor of fifteen?

A) 1/3 B) 1/2 C) 1/6 D) 6/15 E) 2/3

5. When a fair coin is flipped three times, what is the probability that the first flip is heads and the next two flips are the same as one another?

A) 1/3 B) 1/6 C) 1/8 D) 1/2 E) 1/4

6. What is the probability that you roll 2 dice and the sum is 5?

A) 1/12 B) 1/6 C) 1/9 D) 5/36 E) Answer not given

USE THIS INFORMATION FOR PROBLEMS #7 AND #8.

The U.S. (except Alaska and Hawaii) is divided into four time zones. Boston is in the Eastern time zone, Chicago in the Central time zone, Salt Lake City in the Mountain time zone, and Los Angeles (L.A.) in the Pacific time zone. The westernmost zone is the Pacific zone, where the time is Pacific Standard Time (PST). The table shows how PST is related to time in the other 3 time zones.

Mountain Standard Time	PST + 1
Central Standard Time	PST + 2
Eastern Standard Time	PST + 3

7. A plane is flying from Chicago to L.A. at 500 miles per hour. The distance between the cities is 2000 miles. If the plane leaves Chicago at 10:00 AM (Chicago time) and takes two hours for a stop in Salt Lake City, what time will it be in L.A. when the plane arrives?

A) 2 PM B) 12 PM C) 4 PM D) 6 PM E) Answer not given

8. A plane leaves Boston at 10:00 AM (Boston time) and flies non-stop to L.A., 2700 miles away, at 580 miles per hour (mph). On the same route, a second plane is flying non-stop from L.A. to Boston at 620 mph. If the second plane leaves L.A. at 10:00 AM (Los Angeles time), what time will it be in L.A. when the two planes meet?

A) 12:25 PM B) 10:42 AM C) 10:48 AM D) 11:33 AM E) Answer not given

USE THIS INFORMATION FOR PROBLEMS #9 AND #10.

Biff buys one or more notebooks at $1.98 each, and Eho buys one or more notebooks at $1.76 each. The total cost of all the notebooks is between $15 and $20 (ignoring tax). The total exact bill for all the notebooks can be paid entirely in nickels.

9. On the basis of the information given above, how many different total amounts might the notebooks have cost?

A) 1 B) 3 C) 5 D) 7 E) 9

10. If Biff and Eho can each pay their separate exact bills entirely in nickels, how many nickels did they have to pay in all?

A) 374 B) 352 C) 308 D) 187 E) 286

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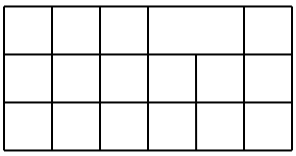
4th Grade – May 19, 2018

Team Contest

1	Find the largest integer less than 2018 that is divisible by 7.
2	What prime number squared is greater than exactly 4 prime numbers?
3	Let x @ y = xy – x - y. Find 7 @ (5 @ 3).
4	What number is $\frac{5}{12}$ of 75% of 160?
5	In a survey of 286 elementary mathematicians, 173 own at least one slide rule and 275 own at least one calculator. If 5 students don't own either, how many own only slide rules?
6	A triangle has side lengths of 6 and 11. How many possible integer values can the third side have?
7	A 7 by 4 inch rectangle lies on top of a 5 by 9 inch rectangle such that the non-overlapping area of the first rectangle is 7 square inches. What is the non-overlapping area of the second rectangle?
8	How many squares of any size appear in the grid of unit squares to the right which is missing one unit line segment? 
9	In the cryptarithm below, each instance of a letter represents the same digit (0-9), and no two different letters represent the same digit. E.g. if one B is a 9 then all Bs are 9s and no C can be a 9. What is the largest possible value of the four-digit number $ABCD$? $\begin{array}{r} ABC \\ -CAB \\ \hline DCB \end{array}$
10	A bag contains some number of 8-faceted stones and 6-faceted stones. Together there are a total of 14 stones and 100 facets. How many 6-faceted stones are in the bag?

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4th Grade – May 19, 2018

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	Sam has 50 roses that he wants to put into bundles of 12 roses. What is the largest number of complete bundles he can make?	4 [bundles]
Person 2	What is the product of 24 and 14 divided by TNYWG?	84
Person 3	In total, X (normal) dogs have TNYWG legs. What is the value of X?	[X=] 21
Person 4	I have TNYWG dollars in standard U.S. coins. If I have 15 dollar coins, 9 quarters, 55 pennies, and 12 dimes, what is the largest number of nickels I could have?	40 [nickels]
	Relay #2	**Answer**
Person 1	How many feet are in 5 yards plus 36 inches?	18 [feet]
Person 2	What is (10 x 3) + 9 – (TNYWG + 4)?	17
Person 3	Add TNYWG to the following sum: 18+13+16+14+15	93
Person 4	One angle of a triangle is TNYWG degrees. If a second angle is 46°, what is the measure, in degrees, of the third angle of the triangle?	41[°]

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4th Grade – May 19, 2018

COLLEGE KNOWLEDGE BOWL ROUND #1 – SET 1

#	Problem	Answer
1	What is the name of the polygon with twice as many sides as a square?	octagon
2	I have eight standard U.S. coins in my pocket. If I have no more than three of any type of coin, what is the smallest number of cents I could have in my pocket?	38 [cents]
3	What is the product of two times four times eight times ten?	640
4	Mark got scores on his five tests of 4, 8, 2, 6 and 2. What was the mode of his scores?	2
5	In a jar of marbles, one out of every seven marbles is blue. If there are nine blue marbles in the jar, what is the total number of marbles in the jar?	63 [marbles]
6	How may millimeters are equal to 1 meter and 3 centimeters	1,030 [mm]
7	Find the sum of three-fourths and one-eighths, and give your answer as a simplified fraction.	7/8
8	Chris's cat Tigger gets fed four times a day. Tigger eats 3 ounces of cat food at 7 AM, at 11 AM, and at 1 PM, and four ounces of cat food at 6 PM. How many ounces of cat food does Tigger eat in a day?	13 [ounces]
9	A palindrome is a counting number that reads the same when its digits are reversed. A 3-digit palindrome is added to another 3-digit counting number to produce a sum of 871. What is the largest possible value of the palindrome?	767
10	Nicole counts backwards from 100 by eights. The first number she says is 100. What is the next number Nicole says that can be divided by 5 with no remainder?	60

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4th Grade – May 19, 2018

COLLEGE KNOWLEDGE BOWL ROUND #2 – SET 2

#	Problem	Answer
1	How many sides does a pentagon have?	5 [sides]
2	It takes 20 **minutes** for Janet to bathe one dog. At this rate,how many **hours** will it take Janet to bathe twelve dogs?	4 [hours]
3	How many cups are in three gallons?	48 [cups]
4	Julia cut a block of cheese into 16 equal parts. She used five parts for a salad and eight parts for macaroni. What reduced fraction of the block was not used?	3/16
5	A total of 108 cows and pigs are on a farm. The ratio of cows to pigs is 3 to 1. How many cows are in the field?	81 [cows]
6	The quotient of 484 divided by 14 is the same as the quotient of what number divided by 7?	242
7	Every day, my cat sleeps half the time between midnight and noon, and two-thirds of the time between noon and midnight. How many hours does my cat sleep every **week**?	98 [hours]
8	Tom has a rectangular pool that measures 15 feet by 20 feet. He wants to put a one-foot wide border around the pool, including the corners. He will use square bricks measuring one foot on a side. How many bricks does he need?	74 [bricks]
9	Find the smallest counting number by which I could multiply 45 to get a product greater than one thousand.	23
10	I have twice as many nickels as quarters, half as many nickels as pennies, and as many dimes as quarters. If I have at least one quarter, what is the smallest number of cents I could have?	49 [cents]

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4th Grade – May 19, 2018

COLLEGE KNOWLEDGE BOWL ROUND #3 – SET 3

#	Problem	Answer
1	Susie is facing due west. She turns 90 degrees to her right. What direction is she now facing?	North
2	Joe has 25 math problems to solve. Each day he gets faster at solving the problems. On day 1, he solves three problems. On day 2, he solves four problems. On day 3, he solves five problems. If this trend continues, on what day will Joe finish solving his problems?	[day] 5 [or the fifth day]
3	Maya walks thirty-five **yards** from her home-room classroom to her music classroom, then walks back to her home-room classroom. How many **feet** does Annie walk?	210 [feet]
4	The product of 4 and 8 is how much greater than the sum of 4 and 8?	20
5	How many cents would one ounce of cereal cost if 24 ounces of cereal cost three dollars and sixty cents?	15 [cents]
6	Twenty percent of the 60 passengers on a bus got off in Seattle. How many passengers were left on the bus?	48 [passengers]
7	How many prime numbers less than 100 can be divided by 3 with no remainder?	1 [prime]
8	Lisa is 15 kilometers from her friend Barbara's house. Lisa walks toward Barbara's house at 6 kilometers per hour. After an hour and a half, how many kilometers away from Barbara's house is Lisa?	6 [km]
9	Alex draws two distinct lines and a circle. What is the largest possible number of points of intersection there could be in Alex's drawing?	5 [points]
10	For how many years from 1984 through 2018 was the product of the digits of the year less than 2?	20 [years]

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COLLEGE KNOWLEDGE BOWL ROUND #4 – SET 4

#	Problem	Answer
1	Thirty cows and twelve chickens are in a field. How many cow feet and chicken feet are in the field altogether?	144 [feet]
2	The length of one diagonal in a rectangle is 11 inches. How many inches long is the other diagonal?	11 [inches]
3	Patty has 2018 cookies in a cookie jar. What is the smallest number of cookies that Patty could take out of the jar so that there would only be a 3-digit number of cookies left?	1019 [cookies]
4	The area of a rectangle is 27 square units. The length is three times the width. What is the number of units in the perimeter of the rectangle?	24 [units]
5	Find the product of zero point two and zero point seven, and give your answer as a decimal.	0.14 or .14
6	The sum of two numbers is 50. One number is six less than the other. What is the smaller of the two numbers?	22
7	What is seventy-five times fifty plus twenty-five times fifty?	5000
8	Each of Andy's steps is twenty-four inches. Each of Mandy's steps is eighteen inches. Andy and Mandy each take the same number of steps. When Andy has walked forty-four feet, how many feet has Mandy walked?	33 [feet]
9	A square number is the product of a counting number times itself. What is the sum of all **even** square numbers less than one hundred?	120
10	The Cat King has three purple, four red, five blue, and seven yellow socks in his drawer. He pulls his socks out of the drawer in his sleep. What is the smallest number of socks he could take out to be sure of getting socks of the same color for each of his four paws?	13 [socks]

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COLLEGE KNOWLEDGE BOWL ROUND #5 – SET 5

#	Problem	Answer
1	The average of four numbers is twenty. Three of the numbers are 18, 25, and 30. What is the fourth number?	7
2	Nina burns 2 calories a minute walking and 7 calories a minute while doing exercises. Nina walked for 11 minutes and did exercises for 15 minutes. How many calories did she burn?	127 [calories]
3	Andrew is four feet nine inches tall. Andrew's father is six feet tall. How many inches shorter than his father is Andrew?	15 [inches]
4	What day of the week will it be twenty-five days after Monday	Friday
5	What is the remainder when the product of the first three prime numbers is divided by the sum of the first three prime numbers?	0
6	The thirty students in a math class were asked to name their single favorite math topic. Ten said probability, 12 said arithmetic, and 8 said geometry. If a student in the class is selected at random, what is the probability that the student's favorite math topic is probability? Answer as a simplified fraction.	1/3
7	A car traveled at 36 miles per hour for 3 hours and 45 minutes. How many miles did the car travel?	135 [miles]
8	Allen takes a test where each right answer gets five points but each wrong answer takes 2 points away from his total score. There are 10 questions on the test. Allen gets half of them right and half of them wrong. How many points does Allen score?	15 [points]
9	Three times my number is twelve more than twice my number. What is my number?	12
10	Subtract three-fifths from five-fourths and give your answer as a reduced fraction	13/20

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COLLEGE KNOWLEDGE BOWL ROUND #6 – SET 6

#	Problem	Answer
1	Subtract 489 from 576.	87
2	The Smith chicken farm produces 396 eggs per day. How many dozen eggs are produced in a week at the Smith chicken farm?	231 [dozen]
3	What number falls half-way between 13 and 21?	17
4	Name the largest of the following four numbers: the fraction five over seven, the fraction thirteen over twelve, the decimal number one point seven, or the fraction thirty-three over fifteen.	33/15
5	How many different prime factors does 45 have?	2 [factors]
6	A spinner is divided into five equal sections. If two of the sections are blue and the rest of the spinner is yellow, what is the probability that the spinner will land on yellow? Give your answer as a simplified fraction.	3/5
7	To write the reversal of a number, write the digits of the number in reverse order. For example, the reversal of ninety-two is twenty-nine. What is the difference when six hundred forty-seven is subtracted from its reversal?	99
8	The ratio of boys to girls at today's contest is 12 to 13. If 144 boys are at the contest, how many girls are at the contest?	156 [girls]
9	Sarah was reading her favorite math book. She started on page thirty-one and read through page one hundred eleven, except that she skipped all pages whose page numbers had the digit "4" in them. How many pages did Sarah read?	64 [pages]
10	My 12-hour digital clock shows hours and minutes, but not seconds. It is now just 3:52 PM, and the sum of the digits on my clock is 10. How many minutes will go by until the next time the sum of the digits on my clock is 10?	14 [minutes]

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COLLEGE KNOWLEDGE BOWL ROUND – EXTRA

#	Problem	Answer
1	What is the sum of the four smallest prime numbers?	17
2	What simplified fraction of the letters in MONDAY (spelled M-O-N-D-A-Y) are also in SUNDAY (spelled S-U-N-D-A-Y)?	2/3
3	If two standard cubical dice are rolled, what is the probability that the same number is NOT rolled twice? Answer as a reduced fraction.	5/6
4	By what multiple does the volume of rectangular prism increase if all its side lengths are tripled?	27
5	What is the probability of having a sum of 4 when you roll 2 fair six-sided die?	1/12

Final Score:

KEY

(Out of 8)

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Student Name _____ Team #_____

School Name _____ Proctor Name_____ Room #_____

4th 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	39 [flowers]		
2	66 [inches]		
3	560		
4	10 4/5		
5	8 [feet]		
6	80		
7	15		
8	23		

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4th Grade – May 19, 2018

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

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4th Grade – May 19, 2018

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	2016		
2	3		
3	35		
4	50		
5	6		
6	11		
7	24 [square inches]		
8	27		
9	9126		
10	6 [six-faceted stones]		

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4th Grade – May 19, 2018

KEY

RELAY # 1

Answer for person # 1	Answer for person # 2	Answer for person # 3	Answer for person # 4
4 [bundles]	84	[X=] 21	40 [nickels]
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
18 [feet]	17	93	41[°]
1 or 0	1 or 0	1 or 0	2 or 0