"Math is Cool" Championships – 2013-14

Sponsored by:

February 7, 2014

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" Championships -- 2013-14

School:_____ Room # _____ Team #_____

Name: _____Proctor: _____

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

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

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

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

"Math is Cool" Masters – 2013-14

February 7, 2014

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" Championships – 2013-14

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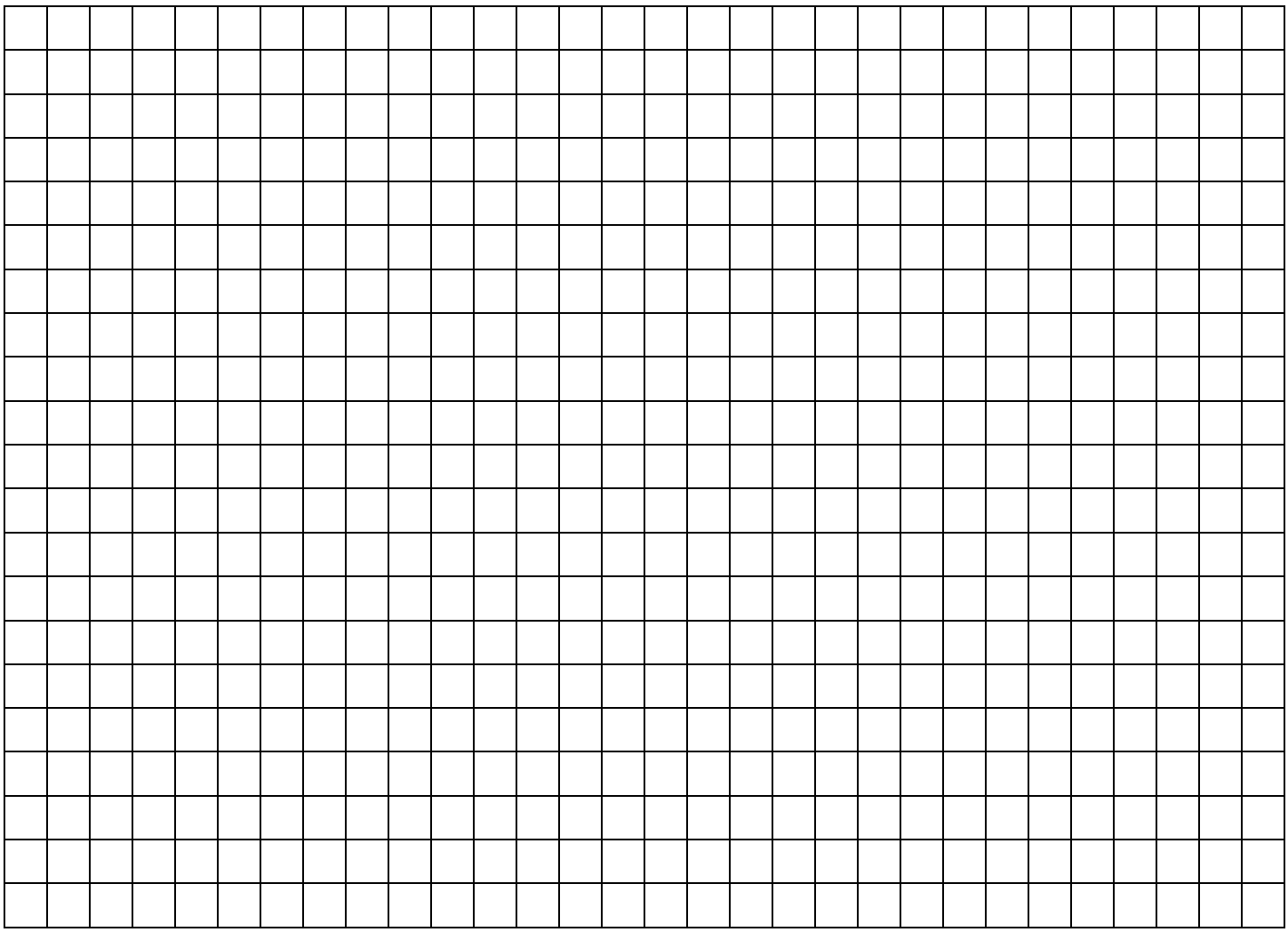
February 7, 2014

6th Grade Individual Contest

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

INDIVIDUAL TEST - 35 minutes

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 – 2013-14

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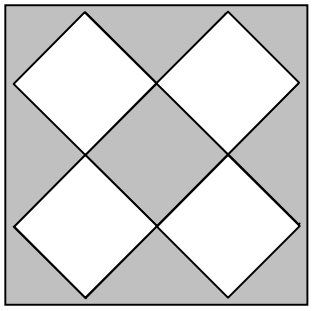
6th Grade – February 7, 2014

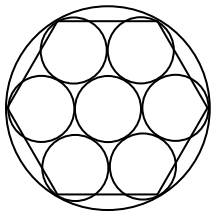
Individual Contest

Record all answers on the colored cover sheet.

	Questions 1-30: 2 points each
1	A triangle has sides of length 4 centimeters, 6 centimeters and 9 centimeters. What is the number of centimeters in the perimeter of the triangle?
2	How many prime numbers are there between 10 and 30?
3	Five people equally share a box of 12 doughnuts. As a mixed number, what is the number of doughnuts that each person gets?
4	What is 140% as a common fraction?
5	What is the least common multiple of 18 and 30?
6	A rectangle has length 6 inches and width 8 inches. What is the number of square inches in the area of the rectangle?
7	Subtract: 54321 - 12345
8	What is the mean of the given data set? 18, 0, 2, 8, 3, 5
9	The point with coordinates (1, 5) is plotted on a coordinate plane. If the point is moved three units right and two units down, what is the sum of the new coordinates?
10	Multiply: $1 \cdot 3 \cdot 5 \cdot 7$
11	What is the difference between the value of 12 times 3 and the value of 12 divided by 3?
12	Erica does homework for an hour and 36 minutes, and then relaxes for 24 minutes. What PERCENTAGE of that total time was spent on homework?
13	Miranda can make one paper crane in 7 minutes. How many could she fully complete in an hour and a half?
14	Solve for x: $6x + 7 = 43$
15	Two elephants are comparing their tusks. Elephant A's tusks are $\frac{3}{4}$ as long as Elephant B's, which are 3 feet long. How many inches long are Elephant A's tusks?
16	As a common fraction, what is the sum of the following expression? $\frac{2}{3} + \frac{1}{4} + \frac{1}{5}$
17	A card is drawn at random from a standard 52-card deck and then returned to the deck. If the deck is then shuffled and a card is selected at random, what is the probability that it is the same card?

18	The area of each of the white squares in the figure shown is one ninth of the area of the total figure. As a common fraction, what is the ratio of the shaded area to the unshaded area? 
19	What is the smallest three-digit counting number that has a two-digit remainder when divided by eleven?
20	Rewrite the following complex fraction as a common fraction: $\dfrac{\frac{12}{7}}{\frac{9}{14}}$
21	Suzy spends 1 hour and 20 minutes at the beach. She collects 52 shells during that time. Maggie collects 14 shells in 20 minutes. In shells per hour, what is the positive difference between their shell-collecting rates?
22	Given the set $\{\frac{1}{2},\ 3,\ 16,\ 1,\ 0\}$, what is the largest possible value of the expression $(a \cdot b) - (c \cdot d)$, where a, b, c, and d are members of the set?
23	Hercules is fighting the Hydra monster. Every time he cuts off one of its heads, three more grow back in its place. If the Hydra starts off with two heads, how many heads would Hercules need to cut off for the Hydra to end up with ten heads?
24	Simon eats $\frac{1}{5}$ of his Halloween candy the first day after Halloween, $\frac{1}{3}$ of the remainder the next day, $\frac{1}{4}$ of what's left on the third day, and half of his remaining supply on the fourth day. If he ends up with 12 pieces after that, how many did he start with?
25	Maria is driving at a constant speed of 60 mph. If it is 4 pm now and she is 230 miles from her destination, what time will it be when she gets there?
26	The remainder when x is divided by 7 is 4. When x is divided by 6 the remainder is 3. What is the smallest positive number x could be?
27	Let x represent any real number. Write a variable expression in terms of x in which x is first increased by five and then that sum is tripled.
28	What is the sum of the counting numbers from 1 through 200 inclusive, minus all multiples of 10 in this range?
29	The Lone Ranger is riding a train going 60 mph due East. Tonto is on a train going 80 mph due South. If the trains started in the same place at the same time, how many miles apart are they 18 minutes later?
30	Simplify: $26(2x - 1) + 9x(3 - 4x) + 8$

Challenge Questions: 3 points each

31	What is the largest prime factor of 627?
32	Marion's class has twenty-four students. At recess, seventeen students play tetherball and fifteen play four-square. If three students play neither tetherball nor four-square, how many play both?
33	A theater has twenty-three rows of seats. The first three rows all have twenty seats. Then the number of seats in rows four through twenty increases by one each time. The number of seats in rows twenty-one through twenty-three increases by two each time. What is the total number of seats in the theater?
34	The first two terms of a number sequence are 1 and 1. Each successive term is generated by doubling the previous term and adding the result to the term before that. For example, the 3^{rd} term equals two times the 2^{nd} term plus the 1^{st} term, or $2(1) + 1 = 3$. The 4^{th} term would be $2(3) + 1 = 7$. What is the first term greater than 1000?
35	How many multiples of 7 are less than 1270 and more than 950?
36	A rectangular field is 40% as wide as it is long, and its perimeter is 182 feet. How many square feet are in its area?
37	A circle of radius three centimeters can contain seven smaller circles of radius one centimeter. All seven smaller circles are tangent (this means they intersect at one point) to each other and to the larger circle. What is the number of centimeters in the perimeter of the hexagon whose vertices correspond with the six internal points of tangency shown in the diagram? 
38	What is the greatest 5-digit counting number with 5 distinct digits that all multiply together to make 720?
39	A data set with five different counting numbers has a range (the difference between the greatest and least number) of thirty and a mean (average) of twenty. What is the largest possible number in the set?
40	I have two thousand one hundred fifty quarters and I place all of them on the sixty-four squares of a chess board so that no square has fewer than two quarters and each square has a different number of quarters. What is the value as a decimal number of dollars, of the largest possible stack of quarters any square on the board could have?

"Math is Cool" Championships – 2013-14

6th Grade – February 7, 2014

School Name____ _____Team #_____

Proctor Name_____Room #_____Division: _____

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" Championships – 2013-14

Sponsored by:

6th Grade – February 7, 2014

Team Multiple Choice Contest

USE THE FOLLOWING INFORMATION TO ANSWER QUESTIONS 1 - 4:

The Sea Star Swim Meet is held annually each year in February. Below are the statistics from last year's meet for the Sea Cucumber team. A swimmer is timed on his performance on four events: Butterfly, Freestyle, Breaststroke, and Backstroke. The Individual Total is the sum of a swimmer's times in the four events. Team Results are determined by the average of the three lowest times by team members in a given event. The Team Total is the sum of the Team Results in the four events.

Individuals from Sea Cucumber Athletics

Swimmer	Butterfly	Freestyle	Breaststroke	Backstroke	Individual Total
Dallin	57 sec	65 sec	79 sec	?	267 sec
Parker	?	70 sec	89 sec	74 sec	299 sec
Tristan	60 sec	58 sec	?	65 sec	?
Arthur	?	51 sec	71 sec	?	246 sec
Bryce	54 sec	59 sec	75 sec	53 sec	?

Team Results from Sea Cucumber Athletics

	Butterfly	Freestyle	Breaststroke	Backstroke	Team Total
Sea Cucumbers	?	?	?	?	?

1 What was Parker's time for the Butterfly?

A) 50 sec B) 58 sec C) 61 sec D) 66 sec E) Answer not given

2 What was the team result for the Freestyle?

A) 60.67 sec B) 58.33 sec C) 58 sec D) 56 sec E) 42 sec

3 Tristan's time in the Breaststroke was exactly $\frac{1}{4}$ of his Individual Total. What was his time in the Breaststroke?

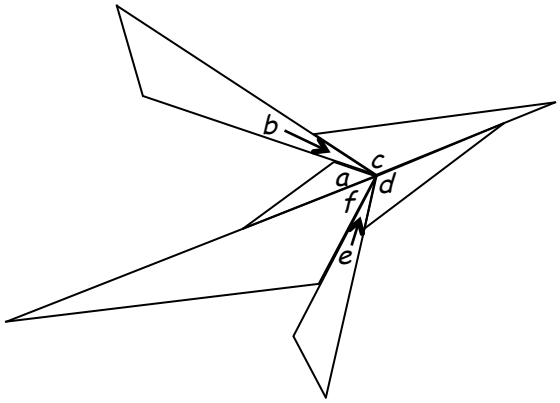
A) 45.75 sec B) 59 sec C) 61 sec D) 61.67 sec E) 63 sec

4 Arthur's time in the Butterfly was the same as his time in the Backstroke. What was the Team Total for the Sea Cucumbers.

A) 1297 sec B) 1134 sec C) 262 sec D) 246 sec E) 242 sec

USE THE FOLLOWING INFORMATION TO ANSWER QUESTIONS 5 - 7:

All six triangles are similar, but no two are congruent. The diagram is to scale and *a, b, c, d, e,* and *f* represent the measures of the six angles in the middle of the diagram which all share the same vertex. Assume the triangles fit together with no gaps or overlapping.



5	What is the number of degrees in the sum $a + d$? A) Cannot be determined B) 90° C) 120° D) 135° E) 150°
6	What is the number of degrees in the sum $a + b + c + d + e + f$? A) Cannot be determined B) 720° C) 540° D) 360° E) 180°
7	What is the number of degrees in the sum $b + d + f$? A) Cannot be determined B) 180° C) 360° D) 540° E) 720°

USE THE FOLLOWING INFORMATION TO ANSWER QUESTIONS 8-10:

In a bowl, Jeremy has 23 marbles, of which 3 are red, 12 are blue, and 8 are green.

8	If Jeremy randomly takes out two marbles without replacement, what is the probability that both will be green? A) $\frac{156}{253}$ B) $\frac{6}{23}$ C) $\frac{28}{253}$ D) $\frac{3}{253}$ E) Answer not given.
9	Jeremy adds N marbles to the bowl. Now, blue is no longer the most likely color for the next marble selected from the bowl at random. What is the smallest possible value for N? A) 2 B) 5 C) 10 D) 13 E) Answer not given.
10	If Jeremy has to replace any marble he takes with one marble of each of the other two colors, what is the probability of taking a blue after taking both a red and a green? A) $\frac{14}{25}$ B) $\frac{12}{25}$ C) $\frac{8}{25}$ D) $\frac{3}{25}$ E) Answer not given.

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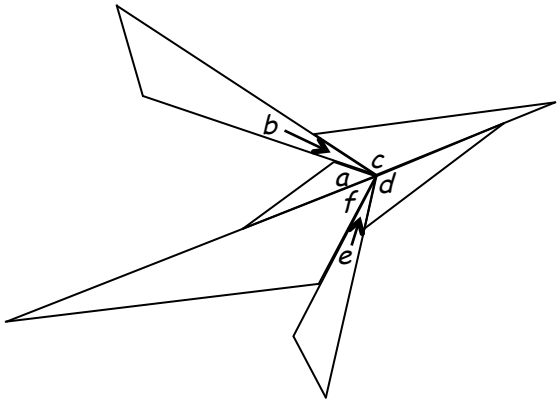

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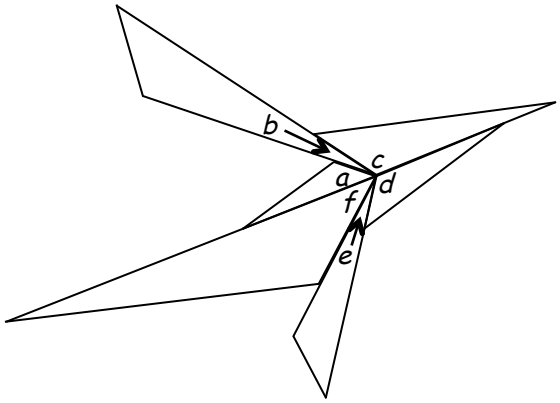

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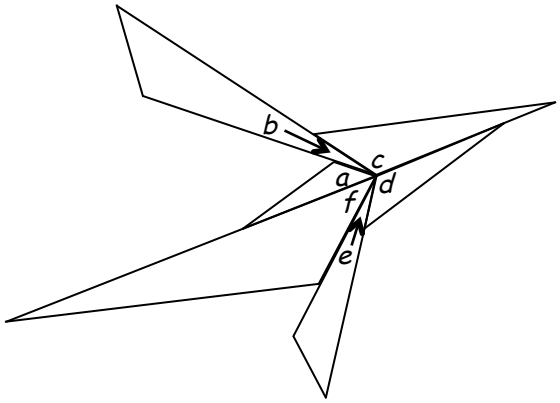

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10	If Jeremy has to replace any marble he takes with one marble of each of the other two colors, what is the probability of taking a blue after taking both a red and a green? A) $\frac{14}{25}$ B) $\frac{12}{25}$ C) $\frac{8}{25}$ D) $\frac{3}{25}$ E) Answer not given.

"Math is Cool" Championships – 2013-14

6th Grade – February 7, 2014

School Name_____Team #_____

Proctor Name_____Room #_____Div: _____

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

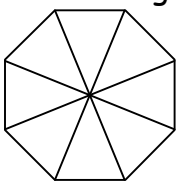
	Answer	1 or 0	1 or 0
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

"Math is Cool" Championships – 2013-14

Sponsored by:

6th Grade – February 7, 2014

Team Contest

1	A regular octagon can be divided into eight congruent triangles as shown. What is the number of degrees in the smallest angle of one of these triangles? 
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3	It takes three men three days to build six birdhouses. How many days does it take nine men to build twelve birdhouses? Assume all men work at the same pace and that all birdhouses take the same amount of time to build.
4	A box of 12 pencils costs $3.79. If Ralph buys as many boxes as he can with $15, what is the decimal number of dollars that he will have left over?
5	A perfect square number is the product of a counting number times itself. What is the sum of the EVEN perfect square numbers between 1 and 150?
6	Rose is making snickerdoodles. Her recipe calls for $\frac{3}{4}$ cup of butter for a batch of 30 cookies. She wants to bake a batch of 40 cookies for a school party. What is the number of cups of butter she will need?
7	Today's date can be written as three counting numbers separated by slashes as follows: 2/7/14. It has the property that the product of the first two numbers equals the third number. What is the number of dates in 2014 that have this property?
8	The book Catching Fire by Suzanne Collins has 391 pages. Assuming the first numbered page is page 7 and all of the following pages are numbered, how many times is the digit 4 used to number all of the pages in the book?

9	Mitzy is holding all of the hearts from a standard deck of cards except for the ACE. The JACK, QUEEN and KING are each worth ten points and TWO through TEN are each worth their face value number of points. Mitzy randomly draws two of her cards. As a reduced fraction, what is the probability that the sum of their point values is sixteen?
10	Roberta's bicycle has tires with a diameter of 75 centimeters. The length of her last ride was 3π kilometers. What is the total number of revolutions made by one of the tires during the ride?

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6th Grade – February 7, 2014

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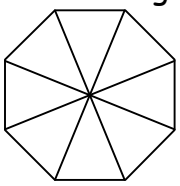
1	A regular octagon can be divided into eight congruent triangles as shown. What is the number of degrees in the smallest angle of one of these triangles? 
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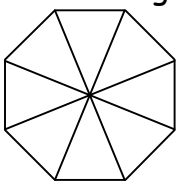
1	A regular octagon can be divided into eight congruent triangles as shown. What is the number of degrees in the smallest angle of one of these triangles? 
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6th Grade – February 7, 2014

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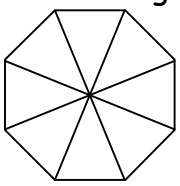
1	A regular octagon can be divided into eight congruent triangles as shown. What is the number of degrees in the smallest angle of one of these triangles? 
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"Math is Cool" Championships -- 2013-14

6th Grade – February 7, 2014

School:_____Team #_____

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PRACTICE RELAY

Text

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

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6th Grade – February 7, 2014

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6th Grade – February 7, 2014

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6th Grade	Practice Relay – Person 1
Question 1	What is the number of feet in one yard?

6th Grade	Practice Relay – Person 1
Question 1	What is the number of feet in one yard?

6th Grade	Practice Relay – Person 2
Question 1	What is the number of feet in one yard?
Question 2	Multiply TNYWG by 15. Text

6th Grade	Practice Relay – Person 2
Question 1	What is the number of feet in one yard?
Question 2	Multiply TNYWG by 15.

6th Grade	Practice Relay – Person 3
Question 2	Multiply TNYWG by 15.
Question 3	Add four to TNYWG.

6th Grade	Practice Relay – Person 3
Question 2	Multiply TNYWG by 15.
Question 3	Add four to TNYWG.

6th Grade	Practice Relay – Person 4
Question 3	Add four to TNYWG.
Question 4	What is the square root of TNYWG?

6th Grade	Practice Relay – Person 4
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6th Grade	**Relay #1 – Person 1**
Question 1	What is the largest two-digit odd number?

6th Grade	**Relay #1 – Person 1**
Question 1	What is the largest two-digit odd number?

6th Grade	Relay #1 – Person 2
Question 1	What is the largest two-digit odd number?
Question 2	Divide TNYWG by 11.

6th Grade	Relay #1 – Person 2
Question 1	What is the largest two-digit odd number?
Question 2	Divide TNYWG by 11.

6th Grade	Relay #1 – Person 3
Question 2	Divide TNYWG by 11.
Question 3	What is TNYWG squared?

6th Grade	Relay #1 – Person 3
Question 2	Divide TNYWG by 11.
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6th Grade	Relay #1 – Person 4
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Question 4	What number to the 4^{th} power equals TNYWG?

6th Grade	Relay #1– Person 4
Question 3	What is TNYWG squared?
Question 4	What number to the 4^{th} power equals TNYWG?

6th Grade	Relay #2 – Person 1
Question 1	7 is evenly divisible by 1 and what other counting number?

6th Grade	Relay #2 – Person 1
Question 1	7 is evenly divisible by 1 and what other counting number?

6th Grade	Relay #2 – Person 2
Question 1	7 is evenly divisible by 1 and what other counting number?
Question 2	What is TNYWG plus 20?

6th Grade	Relay #2 – Person 2
Question 1	7 is evenly divisible by 1 and what other counting number?
Question 2	What is TNYWG plus 20?

6th Grade	Relay #2 – Person 3
Question 2	What is TNYWG plus 20?
Question 3	What is the first prime number greater than TNYWG?

6th Grade	Relay #2 – Person 3
Question 2	What is TNYWG plus 20?
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6th Grade	Relay #2 – Person 4
Question 3	What is the first prime number greater than TNYWG?
Question 4	If you reverse the digits of TNYWG, what is the largest prime factor of the resulting number?

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"Math is Cool" Championships -- 2013-14

6th Grade – February 7, 2014

School:_____ Team #_____

Proctor: _____ Room #_____

College Bowl #1 10 Possible	College Bowl #2 10 Possible	College Bowl #3 10 Possible

Do not use tally marks.

"Math is Cool" Championships – 2013-14

6th Grade – February 7, 2014

School:_____ Team #_____

Proctor: _____ Room #_____

College Bowl #1 10 Possible	College Bowl #2 10 Possible	College Bowl #3 10 Possible

Do not use tally marks.

College Bowls

6th Grade

SETS 1-6

w/Extra Questions at the end.

COLLEGE BOWLS INSTRUCTIONS

Read these to the competitors before first round:

COLLEGE BOWLS - up to 10 minutes per round – 10 problems per round – 10% of team score

1. *All competitors must be facing the front of the room in one row. All spectators need to be behind the competitors.*
2. *A maximum of ten questions per round will be scored. It is OK for both teams to score the same number of points! The proctor will record the points earned on each team's score sheet.*
3. *You may use scratch paper and pencil. You may talk with your teammates while arriving at a solution. An Electronic College Bowl Apparatus (CBA) will be used to identify the first team to have an answer.*
4. *During these rounds, the questions will be read twice and a maximum time of 45 seconds will be allowed for you to answer after the second reading of the question is complete. If a team buzzes in after the second reading and gives an incorrect response, the other team has the remainder of the 45 seconds to respond. You may interrupt (buzz in) while a question is being read, however, if you do, the proctor will stop and an immediate response is needed. If the correct response is given, a new question will be asked. Otherwise, the question will be reread for the other team, making sure it has two full readings. Forty-five seconds will be given for the team to respond from the completion of the last reading. If an immediate response is not given after a team pulls the string, their lack of an answer in a timely manner is considered incorrect. In the event that only one team is competing in a round (i.e., one team is absent), the team competing will have a maximum of 30 seconds in which to buzz in.*
5. *You do not need to wait to be acknowledged by the proctor; however, it is your right to do so if you would like to be acknowledged.*
6. *If two students from the same team answer at the same time with different answers, the answer will be considered incorrect.*
7. *If a problem arises with one of the questions, an extra question will be asked to replace that question. There is only one extra question per round. If the round finishes early, you need to stay in the room for the remaining time.*

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COLLEGE KNOWLEDGE BOWL ROUND #1 – SET 1

#	Problem	Answer
1	In nine minutes, Earl cleans twenty percent of his room. Assuming he works at a constant rate, how many minutes does it take him to clean his entire room?	45 [minutes]
2	In September, Norma lifted weights on three-fifths of the days and went jogging on one-fifth of the days. Norma lifted weights on how many more days than she went jogging?	12 [days]
3	The Easter Bunny loves to hide eggs on Easter every year, but five percent of them are never found. If she hides 500 eggs, how many of them will not be found?	25 [eggs]
4	What is the largest multiple of 13 that is less than 100.	91
5	How many seconds are in one hour and 3 minutes?	3780 [seconds]
6	What is the number of square inches in the area of a right triangle with leg lengths 6 and 8 inches.	24 [square inches]
7	What is the sum of the five smallest positive square numbers?	55
8	As a percentage, what is one half of four thirds of 30 percent?	20 [percent]
9	How many factors of 24 are also factors of 32?	4 [factors]
10	Gerrit buys five hundred thirty-one pieces of candy, costing a total of 63 dollars and 72 cents. How many CENTS does each piece of candy cost?	12 [cents]

"Math is Cool" Championships – 2013-14

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6th Grade – February 7, 2014

COLLEGE KNOWLEDGE BOWL ROUND #2 – SET 2

#	Problem	Answer
1	What is 16 percent of 300?	48
2	Tyson has a fair 20-sided die with faces numbered 1 through 20. He rolls it 3 times and the result is a 20 each time. What is the probability that the result of his 4^{th} roll will be a 20?	$\frac{1}{20}$ or (1 out of 20) or (1 over 20')
3	How many different ways can you arrange the letters in BACON, spelled B-A-C-O-N?	120 [ways]
4	What number needs to be subtracted from the product of two times ten to get 7?	13
5	What is the greatest prime number less than 100?	97
6	A baker bakes a dozen cookies in 14 minutes. At this rate, how many HOURS would it take her to bake 360 cookies?	7 [hours]
7	Sonic collects seven hundred forty-one rings every minute while running. How many minutes did he run if he collected a total four thousand four hundred forty-six rings?	6 [minutes]
8	What is the sum of the least common multiple and the greatest common factor of 24 and 16?	56
9	A rectangular prism has edges with lengths 2, 19, and 53 centimeters. What is the number of cubic centimeters in the volume of the prism?	2014 [cubic cm]
10	Your generous grandmother gives you one dollar on the first day of the year, two dollars on the second day, three dollars on the third day, and so on… How many total dollars will she have given you by the end of a 366-day leap year?	67161 [dollars]

"Math is Cool" Championships – 2013-14

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6th Grade – February 7, 2014

COLLEGE KNOWLEDGE BOWL ROUND #3 – SET 3

#	Problem	Answer
1	What is the next term after 28 in the following sequence: 8, 13, 18, 23, 28, and so on.	33
2	As a common fraction, what is the sum of one half plus one third?	$\frac{5}{6}$ or (5 over 6)
3	What is the radius in centimeters of a circle with a circumference of 36 pi centimeters?	18 [centimeters]
4	As a reduced fraction, what is the probability of randomly drawing an ace from a standard deck of 52 cards?	$\frac{1}{13}$ or (1 out of/over 13)
5	How many minutes are there in a day?	1440 [minutes]
6	A pea plant can beat one zombie in 7 seconds. How many pea plants do you need in order to beat 100 zombies in exactly 70 seconds?	10 [plants]
7	A baker bakes 500 loaves of bread every day. On Friday he sold 89 percent of them and donated the rest to a food bank. How many loaves did he donate on Friday?	55 [loaves of bread]
8	How many diagonals can be drawn from one vertex of a nonagon?	6 [diagonals]
9	If time is money and one second is worth 60 cents, how many dimes is one minute worth?	360 [dimes]
10	A cup is 10 percent filled with water. A second cup, with twice the volume of the first cup, is 100 percent full of water. Twenty percent of the second cup's water is poured into the first cup. What percent of the first cup is now filled with water?	50 [percent]

"Math is Cool" Championships – 2013-14

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6th Grade – February 7, 2014

COLLEGE KNOWLEDGE BOWL ROUND #4 – SET 4

#	Problem	Answer
1	What is the number of centimeters in 300 meters.	30000 or thirty thousand [centimeters]
2	Hank needs 7 gallons of gas to fill up his tank. A gallon of gas costs 3 dollars and 45 cents. As a decimal number of dollars, how much will the gas cost?	[$]24.15 or "twenty-four, fifteen"
3	Mario has 17 lives remaining and 5 levels to complete. He loses 2 lives for each level he completes. How many lives will he have left after completing the 5 levels?	7 [lives]
4	Given an 8 by 7 rectangle, what is the largest number of 1 by 1 squares that can be laid flat on top of the rectangle without overlapping or extending beyond the rectangle's edges?	56 [squares]
5	What is three divided by one-fourth?	12
6	As a decimal, what is three point one four one five times one thousand?	3141.5
7	In five tries at solving a Rubik's cube, it took Chris 12, 38, 38, 22 and 20 seconds. What is the average number of seconds it took Chris to solve the cube?	26 [seconds]
8	What is the sum of the five smallest positive multiples of the number 3?	45
9	What is the greatest common factor of one hundred thirty-eight and one hundred fifteen?	23
10	In cubic meters, what is the volume of a pyramid with base area 9 square meters and height 12 meters?	36 [cubic meters]

"Math is Cool" Championships – 2013-14

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6th Grade – February 7, 2014

COLLEGE KNOWLEDGE BOWL ROUND #5 – SET 5

#	Problem	Answer
1	What is four hundred fifty-six minus four hundred sixty-five?	negative 9 or minus 9
2	What is 30 percent of one thousand and eighty?	324
3	How many seconds are in four and three-fourths minutes?	285 [seconds]
4	In the set of counting numbers from 1 to 20, what is the largest prime number minus the smallest prime number?	17
5	When playing flash games, Kent gets 4 achievements every half hour. If Kent plays flash games 2 hours a day for seven days, how many achievements will he get?	112 [achievements]
6	What is the number of square inches in the area of a triangle with side lengths 5, 12 and 13 inches?	30 [square inches]
7	Express the decimal "one point seven five" as a common fraction.	$\frac{7}{4}$ or (7 over 4)
8	A circle is divided into three sectors of equal area. The sectors are numbered 1, 2, and 3. If two sectors are randomly selected, one after the other, as a common fraction what is the probability that sector 1 is chosen both times?	$\frac{1}{9}$ or (1 out of/over 9)
9	What is the number of cubic feet in the volume of a cylinder with base radius 2 feet and height 8 feet?	32 pi [cubic feet]
10	As a whole number, what is the reciprocal of the fraction "thirty over two hundred and ten"?	7

"Math is Cool" Championships – 2013-14

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COLLEGE KNOWLEDGE BOWL ROUND #6 – SET 6

#	Problem	Answer
1	What is the number of inches in the diameter of a circle with area 25 pi square inches?	10 [inches]
2	Mining a diamond patch in Minecraft will give you 3 to 5 diamonds every time. You need 24 diamonds for a full set of armor. How many diamond patches must you mine to ensure you have enough diamonds for a full set of armor?	8 [diamond patches]
3	What is the value of 6 to the third power?	216
4	A yard equals three feet. A mile equals 5280 feet. How many yards are in one mile?	1760 [yards]
5	Joanna is facing due east. She turns left 90 degrees three times. What direction is she facing?	[due] South
6	Express "three-eighths" as a decimal rounded to the nearest hundredth.	.38
7	What is the sum of the positive factors of 32?	63
8	As a common fraction, what is the probability of rolling a sum of 2 when rolling two standard six sided dice?	$\frac{1}{36}$ or (1 out of/over 36)
9	An ant is walking along the perimeter of a rectangle with dimensions 10 feet by 20 feet. The ant never strays from the perimeter of the rectangle and always walks counterclockwise for a total distance of 180 feet. What is the number of times the ant walks around the rectangle?	3 [times]
10	The fraction "eighty-one over two hundred forty-three" is how many times as large as the fraction "six over fifty-four"?	3 [times as large]

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COLLEGE KNOWLEDGE BOWL ROUND – EXTRA

#	Problem	Answer
1	What is the probability of flipping a coin three times and getting heads all three times?	$\frac{1}{8}$ or (1 out of/over 8)
2	A math class has 10 boys and 15 girls. As a common fraction, what is the ratio of girls to boys in the class?	$\frac{3}{2}$ or (3 over 2)
3	What is the largest factor of 51 other than 51?	17

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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	What is three-fourths of fifty-two?
2	What is the sum of the counting numbers from five through nine, including five and nine?
3	Tommy is twelve years old and his mother is thirty-eight years old. What is the average of their ages, in years?
4	What is the largest EVEN three-digit counting number?
5	What number is two hundred and fifty percent of eighteen?
6	A number is randomly selected from the set of counting numbers one through ten. As a reduced fraction, what is the probability that it is a prime number?
7	Joanne has thirty dollars. She buys four books, each costing seven dollars and twenty-seven cents. How many CENTS does she have left over?
8	A square and a non-square rectangle both have an area of twenty-five square centimeters. The length and the width of the rectangle are whole numbers. What is the number of centimeters in the difference between the perimeter of the rectangle and the perimeter of the square?

"Math is Cool" Championships -- 2013-14

School:_____ Room # _____ Team #_____

Name: _____Proctor: _____

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

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

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

	Answer	1 or 0	1 or 0
1	39		
2	35		
3	25 [years]		
4	998		
5	45		
6	$\frac{2}{5}$ or "2 out of 5"		
7	92 [cents]		
8	32 [centimeters]		

"Math is Cool" Masters – 2013-14

February 7, 2014

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	19 [cm]		
2	6 [prime num]		
3	$2\frac{2}{5}$ [doughnuts]		
4	7/5		
5	90		
6	48 [square in]		
7	41976		
8	6		
9	7		
10	105		
11	32		
12	80 [%]		
13	12 [cranes]		
14	[x=] 6		
15	27 [inches]		
1-15 TOTAL:			

	Answer	1 or 0	1 or 0
16	67/60		
17	1/52		
18	5/4		
19	109		
20	8/3		
21	3 [shells per hr]		
22	48		
23	4 [heads]		
24	60 [pieces of candy]		
25	7:50 pm		
26	[x=] 39		
27	3(x + 5) or 3x + 15 or equivalent		
28	18000		
29	30 [miles]		
30	$-36x^2 + 79x - 18$ [in any order]		
16-30 TOTAL:			

	Answer	1 or 0	1 or 0
31	19		
32	11 [students]		
33	676 [seats]		
34	1393		
35	46 [multiples]		
36	1690 [ft^2]		
37	18 [cm]		
38	98521		
39	42		
40	[$] 17.75		
31-40 TOTAL:			

6th Grade

"Math is Cool" Championships – 2013-14

6th Grade – February 7, 2014

School Name____ _____Team #_____

Proctor Name_____Room #_____Division: _____

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

"Math is Cool" Championships – 2013-14

6th Grade – February 7, 2014

School Name_____Team #_____

Proctor Name_____Room #_____Div: _____

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	$45^{[\circ]}$		
2	23 [years]		
3	2 [days]		
4	[$]3.63		
5	364		
6	1 [cup]		
7	3 [dates]		
8	78 [times]		
9	$\frac{5}{66}$		
10	4000 [revolutions]		

"Math is Cool" Championships -- 2013-14

KEY

6th Grade – February 7, 2014

School:_____Team #_____

Proctor: _____ Room #_____Div _____

PRACTICE RELAY

Answer for person # 1	Answer for person # 2	Answer for person # 3	Answer for person # 4
3 [feet]	**45**	**49**	**7**
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
99	**9**	**81**	**3**
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
7	**27**	**29**	**23**
1 or 0	1 or 0	1 or 0	2 or 0