# "Math is Cool" Masters – 2011-12

Sponsored by:

4th Grade – May 19, 2012

**GENERAL INSTRUCTIONS/INFORMATION applying to all tests and awards:**

- *Good sportsmanship is expected throughout the competition by all involved; both competitors and observers. Display of poor sportsmanship may result in disqualification.*
- *Calculators or any other aids may not be used on any portion of this contest.*
- *Unless stated otherwise, all rational, non-integer answers need to be expressed as reduced common fractions except in case of problems dealing with money. In the case of problems requiring dollar answers, answer as a decimal rounded to the nearest hundredth (ie, to the nearest cent).*
- *For fifth and sixth grade, all fractions and ratios must be reduced to simplest form.*
- *Counting or natural numbers refer to the numbers 1,2,3,4 and so on – zero (0) is NOT included.*
- *Units are not necessary as part of your answer unless it is a problem that deals with time and in that case, a.m. or p.m. is required. However, if you choose to use units, they must be correct.*
- *Leave all answers in terms of π where applicable.*
- *Do not round any answers unless stated otherwise.*
- *Record all answers on the colored cover sheets in the answer column only.*
- *Make sure all answer sheets have all the information (name, team number, etc.) at the top of the sheet filled out.*
- *Tests will be scored as a 0 if answers are not recorded on the answer sheets.*
- *Blank answer sheets and answer sheets with no name will be scored as a 0.*
- *Individual Awards are determined by the sum of an individual's Mental Math score and Individual Test score. Individual Mental Math contributes to approximately 8% of the individual score. Individual ties are broken based on the following in this order: total individual points, total questions answered correctly, individual Mental Math score, total correct from Individual Test problems 31-40, total correct from Individual Test questions 16-30, single questions answered correctly on the Individual Test starting with question 40 and working backwards.*
- *Team Awards are determined by the team score which is calculated by 2(Top 3 Mental Math scores) + 2(Multiple Choice) + 6(Team) + 3(Relay) + (College Bowl) for approximate weights of 25%, 20%, 30%, 15% and 10% respectively. Team ties are broken based on highest event score in order of events starting with Mental Math.*

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## Mental Math Contest

**MENTAL MATH** - 30 seconds per question – 25% of team score

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

| | Question |
|---|---|
| 1 | Determine the side length in inches of a square with area 16 square inches. |
| 2 | An angle has a degree measure of 112 degrees. Is this angle acute, right, or obtuse? |
| 3 | Find the value of eighteen plus seven minus nine. |
| 4 | Josh had a dozen chickens, but then a chicken thief came and stole one-fourth of his chickens. How many chickens does Josh have left? |
| 5 | If each parking lot can hold 7 cars, how many total cars can 12 parking lots hold? |
| 6 | Alice had $19 and then earned $5 more. Bob had $19 and then spent $5. How many more dollars does Alice now have than Bob? |
| 7 | What is three-halves minus three-fourths? Answer as a reduced fraction. |
| 8 | How many counting numbers are less than 54 but greater than 10? |

# "Math is Cool" Masters – 2011-12

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Individual Contest

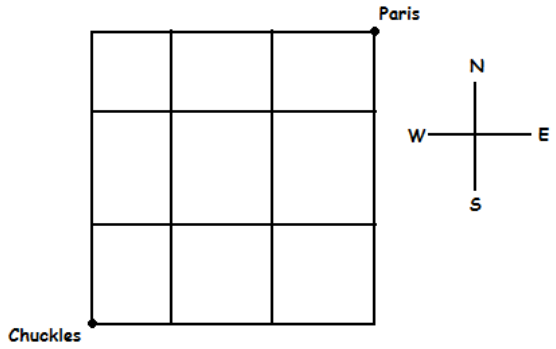
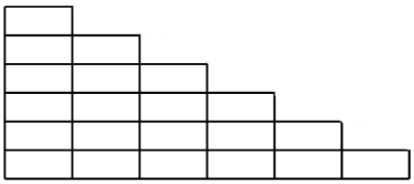
**INDIVIDUAL TEST - 35 minutes – 40 problems**

*You may NOT be seated next to anyone from your school. If you are, MOVE NOW to avoid being disqualified! When you are prompted to begin, tear off the colored sheet and begin testing. Make sure your name and school are recorded on the answer sheet. The raw score will be 2 points for correct answers to problems 1-30 and 3 points for 31-40. Record your answers on the score sheet. No talking during the test. You will be given a 5 minute time warning.*

Record all answers on the colored cover sheet.

| | Questions 1-30: 2 points each |
|---|---|
| 1 | Logan has measured a park and is making a scale drawing of it. A bench that is actually 6 feet long is 2 inches long in the drawing. Find the number that goes in the blank to describe the scale of the drawing. scale factor: 1 inch (drawing) = _____ feet (actual) |
| 2 | What is the smallest whole number I could subtract from 2012 to get an answer less than 1000? |
| 3 | Nita draws 12 different squares — one each with whole-number side lengths 1, 2, 3, and so on up through 12 inches. She then calculates the area (in square inches) of each of her squares. For how many of her 12 squares will the area be an odd number? |
| 4 | What is the remainder when 234,098,654,832,086,345,868,904,302,985 is divided by 2? |
| 5 | In tennis the average point is 10 strokes, the average game is 6 points, the average set is 10 games, and the average match is 2 sets. How many strokes are hit in an average match? |
| 6 | Find the sum of 1.234 and 5.67, and give your answer as a decimal. |
| 7 | There are 3 bowls of porridge (big, medium, and small). The big bowl is Papa Bear's, the medium-sized bowl is Mama Bear's, and the small bowl is Baby Bear's. How many ways are there to distribute the 3 bowls of porridge (one to each bear) so that every bear receives the wrong bowl size? |
| 8 | Find the number that goes in the blank to make the equation true. $4 + 9 + 36 = 4 \times 9 + \_\_\_$ |
| 9 | When 50 is subtracted from twice my number, the result is 100. What is my number? |
| 10 | What is the difference between the smallest five-digit counting number and the largest three-digit counting number? |
| 11 | Mitchell is 6 feet __ inches tall. If Mitchell is 76 inches tall, what number goes in the blank? |
| 12 | Karen wants to decorate a birthday cake for her friend Hailey. If it takes Karen 8 seconds to write each letter in frosting, how many seconds would it take for Karen to write "Happy Birthday Hailey" in frosting? |

| | |
|---|---|
| 13 | Three little kittens each had one mitten for each of its paws. If the kittens lost one-fourth of their mittens, how many mittens do they have left? |
| 14 | Joey has 2 gallons of milk. How many pints of milk does he have? |
| 15 | Grant has red ants, black ants, and brown ants. The three types are of different sizes. The largest ants aren't red, and the middle-sized ants aren't black. If the brown ants are either the largest or the smallest, what color are the middle-sized ants? |
| 16 | Grant's ants are on the loose! They are marching in 12 rows, with 16 ants in each row. If one anteater can eat 4 ants, how many anteaters will be needed to eat all of Grant's ants? |
| 17 | School starts at 8:20 AM, and Mr. Sampson needs to be at the school 15 minutes before class starts. If it takes him 1 hour and 15 minutes to drive from his house to the school, what time does he need to leave his house? |
| 18 | How many prime numbers less than 50 have "6" as one of their digits? |
| 19 | The sum of (21 x 1000) and (21000 ÷ 1000) is equal to 21 times X. What is the value of X? |
| 20 | Brandt got a math book for Christmas in 2011, and started working problems in it on Christmas Day (December 25$^{th}$). He worked problems every day, and finished the book on March 18, 2012. How many days did it take him to finish? NOTE: 2012 is a leap year. |
| 21 | Pat gives half of her raisins to Steph, and then gives 1/3 of the remaining raisins to Laura. After sharing with Steph and Laura, Pat had 6 raisins left. How many raisins did Pat start with? |
| 22 | Given the equation $y = 7x - 9$, find y when $x = 4$. |
| 23 | On Moritz's Farm, there are 8 spiders, 7 pigs and 17 ants. A spider has 8 legs, a pig has 4 legs, and an ant has 6 legs. Each organism has one head. What is the total number of heads and legs on Moritz's Farm? |
| 24 | Mitchell bought three oranges. One orange weighed 14 ounces (oz), another weighed 13 oz, and the third weighed 17 oz. How many **pounds** do the three oranges weigh together? If your answer is not a whole number, give it as a **decimal**. |
| 25 | In the 400-meter hurdle race in track, the first hurdle is 45 meters from the starting line. The last hurdle is 40 meters from the finish line while all the other hurdles are 35 meters apart. How many hurdles are in the 400-meter hurdle race? |
| 26 | Alice, Bob, Caroline, Debby, and Eureka are standing in a line for the movie "Finding Nemo." In how many orders can these five people stand in line, if Alice must be in the middle of the line and Bob must be in the front of the line? |
| 27 | When $x = 4$, what is the value of the following expression? $x( 1 + x ) - (x \div 2)$ |
| 28 | A counting number is "cozy" if the sum of its digits will divide into the number with no remainder. How many 2-digit counting numbers less than 25 are "cozy"? |
| 29 | A grocery store has equal numbers of green apples and yellow apples. The green apples were put into bags of 14 apples per bag with none left over, while the yellow apples were put into bags of 10 per bag with none left over. What is the least number of green apples the store could have, if they have at least one? |
| 30 | Brian's little brother Jimmy, who is just learning arithmetic, wrote the incorrect multiplication equation 943 x 75 = 63215. Brian changed three of the 10 digits of this equation to 0, producing a correct equation. What is the sum of the 3 digits that Brian changed to 0? |
| Challenge Questions: 3 points each | |
| 31 | Robert is stacking baseballs in the form of a pyramid. The base is a rectangle that measures 4 baseballs by 6 baseballs. Each baseball above the base rests on 4 baseballs below it. How many total baseballs are used in this pyramid? |

| | |
|---|---|
| 32 | The Cool Math Club held a bake sale. They sold cakes for $3.50 each and pies for $6 each. They sold 24 items for a total of $119. The club donated 40 percent of the money earned from selling **cakes** to a charity. How many dollars did the club donate to charity? |
| 33 | Bailey's clock runs slow. For every minute of time that passes, her clock hands only move 40 seconds. If she sets her clock correctly at 3 PM, what is the correct time when her clock next shows 7:24 PM? |
| 34 | In how many different ways can 7 diamonds be given to Anna, Bobby, and Chris if each person receives at least one diamond? |
| 35 | Holly earns $5 every day for taking care of her neighbor's cat. Every third day, she spends $6, but saves the rest of her earnings. After Holly was paid today, she spent $6, and then had $452 left in her savings. How many days from today will it take for her to have at least $1,200 in savings, assuming that she gets paid first on any day that she spends money? |
| 36 | Chuckles the elephant is trying to get to Paris! The map to Paris is shown below.<br>  <br>If Chuckles can only walk along the lines going east or north, how many paths can she take? |
| 37 | Don is building a staircase pattern as shown in the figure. Each block is one foot high. How many blocks would it take to build steps that would be 20 feet high?<br>  |
| 38 | Adam can run a lap on a certain circular track in 50 seconds. Grampy Sampy can run a lap on this track in 90 seconds. They start at the same location at the same time and move in the same direction. If they each run at a constant speed, how many seconds will it take before Adam is next even with Grampy Sampy? If your answer is not a whole number, give it as a decimal. |
| 39 | Mark has some cookies, but Noah doesn't. Mark gives $\frac{3}{4}$ of his cookies to Noah. Half of the cookies Noah gets are peanut butter, which Noah doesn't like. So Noah gives the peanut butter cookies back to Mark. Mark eats $\frac{3}{5}$ of the cookies he has now, saving 28 cookies for later. How many cookies did Mark start with? (Only whole cookies are exchanged.) |
| 40 | Ruthie has 10 coins, all either nickels, dimes, or quarters. She has N nickels, D dimes, and Q quarters, where N, D, and Q are all different, and are each at least 1. Amazingly, she would have the same amount of money if she had Q nickels, N dimes, and D quarters. How many **cents** does Ruthie have? |

# "Math is Cool" Masters – 2011-12

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## 4th Grade – May 19, 2012

## Team Multiple Choice Contest

Four schools participated in a math competition, with each school represented by five contestants. Each contestant took 4 tests (Mental Math, Speed Math, Mystery Test, and Individual Test). Each test has a maximum of 100 points. The table below shows the results for the 5 contestants from one team (Mount Rainier).
USE THIS INFORMATION AS NEEDED TO SOLVE THE PROBLEMS BELOW.

Individuals from Mount Rainier

| Contestant | Mental Math | Speed Math | Mystery Test | Individual Test |
|---|---|---|---|---|
| Trung | 56 | 40 | 5 | 66 |
| Bert | 17 | 45 | 97 | 27 |
| Stacey | 80 | ? | 20 | 68 |
| James | 77 | 53 | ? | 64 |
| Ernie | 22 | 30 | 2 | ? |

| | |
|---|---|
| 1 | James's score on the Mystery Test is twice Bert's score on Mental Math. What is James's score on the Mystery Test?<br>A) 8 B) 17 C) 34 D) 46 E) Answer not given. |
| 2 | Of the 5 Mount Rainier contestants, 3 ranked higher than all their teammates on at least one test. Which 2 Mount Rainier students did not rank higher than their teammates on any test?<br>A) Ernie & Trung B) Bert & James C) Stacey & Trung D) Ernie & James E) Bert & Ernie |
| 3 | Stacey's Speed Math score was the average (mean) of the Speed Math scores of her four teammates. What is the average Speed Math score of the five Mount Rainier students?<br>A) 52 B) 42 C) 84 D) 21 E) Answer not given. |
| 4 | The average (mean) of the Individual Test scores for the five Mount Rainier contestants was 51.2. What was the mean of Ernie's four test scores?<br>A) 18 B) 26.3 C) 31 D) 12.8 E) Answer not given. |
| 5 | The contestants from Mount Rainier want to sit around a circular table. How many different ways can they seat themselves? Consider only the order in which they sit, not their position in relation to the room.<br>A) 24 B) 120 C) 160 D) 200 E) Answer not given |
| 6 | The Mount Rainier team buys 3 pizzas. Each pizza costs $6.55, and they pay with a $20 bill. How many different combinations of coins can they receive in change, if change is only made with dimes, nickels, and/or pennies?<br>A) 14 B) 16 C) 18 D) 20 E) Answer not given. |

**PROBLEM RESTATED:**
Four schools participated in a math competition, with each school represented by five contestants. Each contestant took 4 tests (Mental Math, Speed Math, Mystery Test, and Individual Test). Each test has a maximum of 100 points. The table below shows the results for the 5 contestants from one team (Mount Rainier).
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| James | 77 | 53 | ? | 64 |
| Ernie | 22 | 30 | 2 | ? |

| | |
|---|---|
| 7 | The Mount Rainier team buys 3 pizzas, each with 8 slices. Trung eats four fewer slices than three times the number James eats. James eats one more slice than Stacey, who eats five slices fewer than Ernie. Ernie eats seven slices of pizza. Bert eats all the remaining slices of pizza. How many slices does Bert eat?<br>A) 5 B) 6 C) 7 D) 8 E) Answer not given. |
| 8 | The five Mystery Test scores of the Moses Lake team were all different counting numbers. The average of the five scores was 60, and the range was 80. The lowest score was at least 10% of the highest score. What is the largest possible value of the median of these five scores?<br>A) 60 B) 63 C) 79 D) 90 E) Answer not given. |
| 9 | At the end of the competition each of the four schools is awarded a plaque for its rank (1st through 4th place). Unfortunately, someone mixed up the awards so each school is handed a plaque at random. What is the probability that each school gets the correct plaque?<br>A) 1/24 B) 1/8 C) 1/4 D) 1/2 E) Answer not given. |
| 10 | After awards have been distributed, every participant shook hands with every other participant, including his or her teammates. How many handshakes occur?<br>A) 20 B) 10 C) 125 D) 190 E) Answer not given. |

# "Math is Cool" Masters – 2011-12

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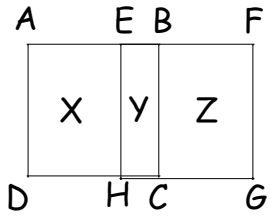
## 4th Grade – May 19, 2012

## Team Contest

| | |
|---|---|
| 1 | Will and Catherine are playing a board game. If it takes 9 minutes to complete their game, how many times will they be able to play the game completely in 1 hour and 10 minutes? |
| 2 | In basketball, a basket is worth either 3 points or 2 points, and a free-throw is worth 1 point. James made 24 points in a game. If he made six 2-pointers and six free-throws, how many 3-pointers did he make? |
| 3 | Alice had 98¢. She bought two oranges and an apple. Each orange costs the same amount, and an apple costs half as much as an orange. If Alice had 23¢ left after her purchases, what is the price in cents of one orange? |
| 4 | Peter is flying from New York to Scotland. The flight is 8 hours long and there is a 5-hour time difference, such that if it is 3 PM in New York it is 8 PM in Scotland. If Peter leaves New York at 5 AM, what time will it be in Scotland when he arrives? |
| 5 | The phrase "*GO COUGS*" is written repeatedly without spaces (*GOCOUGSGOCOUGSGO…*). What is the least number of letters that could have been written when the 3-letter sequence *GSG* occurs 10 times? |
| 6 | Two congruent squares (ABCD and EFGH) are overlapped as shown, to form regions X, Y, and Z. The ratio of the areas of these three regions is X:Y:Z = 2:1:2. What is the least possible whole-number area (in square units) of rectangle AFGD if the length of segment EB is a whole number of units?   |
| 7 | A square number is the result of multiplying a counting number by itself. My house number has five digits (*abcde*). If each pair of consecutive digits (*ab*, *bc*, *cd*, and *de*) forms a 2-digit square number, what is my house number? (NOTE: A 2-digit number cannot have 0 as its tens digit.) |
| 8 | I am thinking of a counting number less than 50. When I double my number and subtract 1, the answer is a multiple of 3. If I divide this answer by 3, the quotient is Q. What is the largest possible value for Q? |
| 9 | Cam rolls three standard cubical dice and multiplies the numbers he rolls. The product of the three numbers is 36. What is the largest possible sum of these three numbers? |
| 10 | Uncle Scrooge hid $2100 cash, divided among four boxes. He hid only $50 bills in a blue box, only $20 bills in a red box, only $10 bills in a yellow box, and only $5 bills in a white box. In one box, he hid 50 bills, in the second box he hid 20 bills, in the third box he hid 10 bills, and in the fourth box he hid 5 bills. How many dollars did Uncle Scrooge hide in the yellow box? |

# "Math is Cool" Masters – 2011-12

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## 4th Grade – May 19, 2012

## Relay Contest

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

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

| | **Relay #1** | |
|---|---|---|
| Question 1 | What is the sum of the 5 smallest counting numbers? | 15 |
| Question 2 | How many different counting numbers will divide into TNYWG with no remainder? | 4 [numbers] |
| Question 3 | What is the product when three copies of TNYWG are multiplied together? | 64 |
| Question 4 | TNYWG is equal to the product of N times itself. What is the product of (N + 5) times itself? | 169 |
| | **Relay #2** | |
| Question 1 | What do you get when you multiply the $7^{th}$ odd counting number by the $10^{th}$ even counting number? | 260 |
| Question 2 | Ariel divides TNYWG by 2, and then divides that quotient by 2, and so on, until she has divided 10 times. How many of these times does Ariel get a counting number as her answer? | 2 [times] |
| Question 3 | What number multiplied by 25 gives the same product as TNYWG multiplied by 100? | 8 |
| Question 4 | If you have 3 different pencils (red, yellow, and blue) and TNYWG different notebooks, how many different combinations of 2 pencils and 1 notebook can you make? | 24 [combinations] |

# "Math is Cool" Masters – 2011-12

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4th Grade – May 19, 2012

## COLLEGE KNOWLEDGE BOWL ROUND #1 - SET 1

| # | Problem | Answer |
|---|---|---|
| 1 | Beth has a bag with 5 red marbles and 3 green marbles in it. If she takes out one marble at random, what is the probability that it will be green? Answer as a fraction. | 3/8 |
| 2 | Sam had 20 gummy bears. He gave half of them to Kim, and then gave 4 to Delia. How many gummy bears did Sam have left? | 6 [gummy bears] |
| 3 | There are a total of 96 legs in a group of six-legged beetles. How many beetles are there in the group? | 16 [beetles] |
| 4 | What is the smallest possible sum of the digits of a counting number between 12 and 2012? | 1 |
| 5 | How many zeros will it take to write the number "ten thousand"? | 4 [zeros] |
| 6 | On Sunday, Sarah ate one cherry. She then ate two cherries on Monday, four on Tuesday, eight on Wednesday, and so on, all week. How many cherries did Sarah eat on Saturday of that week? | 64 [cherries] |
| 7 | How many more sides does a hexagon have than a quadrilateral? | 2 [sides] |
| 8 | Tony gets on an elevator. He travels up 7 floors, then down 3 floors. If this puts him on the $6^{th}$ floor, on which floor did he get on the elevator? | $2^{nd}$ [floor] or 2 |
| 9 | Jay draws a square with a side length of 15 centimeters. Inside Jay's square, Kay draws a square with a side length of 7 centimeters. How many square centimeters are in the area that is outside Kay's square but inside Jay's square? | 176 [square cm] |
| 10 | What is the product of the seventh prime number and the tenth prime number? | 493 |

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## COLLEGE KNOWLEDGE BOWL ROUND #2 - SET 2

| # | Problem | Answer |
|---|---|---|
| 1 | Find the value of 676 minus 293. | 383 |
| 2 | Jimmy has 3 different shirts and 2 different jackets. How many possible combinations of one shirt and one jacket can he make? | 6 [combinations] |
| 3 | Sally went to the zoo for 5 hours. While she was there, she only saw 10 lions, 4 tigers, and 1 bear. On average, how many animals did she see per hour at the zoo? | 3 [animals] |
| 4 | When I count backwards from 99 by 5's, what is the second EVEN number I will say? | 84 |
| 5 | It takes Jacob 120 minutes to run the 12 miles from his school to his house. At this rate, how many minutes would it take Jacob to run one mile? | 10 [minutes] |
| 6 | If a circle has a diameter of 16 units, how many units long is its radius? | 8 [units] |
| 7 | I pay $2 for 4 OUNCES of cheese. At this same price per weight, how much (in dollars) would 3 POUNDS of cheese cost? | 24 [dollars] |
| 8 | Find the remainder when 324 is divided by 9. | 0 |
| 9 | When Liza added the first ten counting numbers, she got the incorrect sum of 48. Liza's mistake was that she left out one of the ten numbers, but she correctly added the other nine. Which number did Liza leave out of her sum? | 7 |
| 10 | Kyle starts climbing a hill on Tuesday morning. Every morning he climbs 70 feet, and every afternoon, he falls back 20 feet. If the hill is 165 feet tall, on what day of the week will Kyle reach the top of the hill? | Thursday |

# "Math is Cool" Masters – 2011-12

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4th Grade – May 19, 2012

## COLLEGE KNOWLEDGE BOWL ROUND #3 - SET 3

| # | Problem | Answer |
|---|---|---|
| 1 | Donna only eats doughnuts on Tuesdays. If she eats 7 doughnuts every Tuesday, how many doughnuts will she eat within a 4-week time period? | 28 [doughnuts] |
| 2 | What is the hundreds digit of the number twenty-four thousand, five hundred one? | 5 |
| 3 | What time will it be 70 minutes after 10:30 AM? | 11:40 AM |
| 4 | Gregg picks 3 flowers each day for a whole week. If he can put at most 4 flowers in a vase, how many vases does he need to hold all his flowers? | 6 [vases] |
| 5 | What is two-hundred ninety-nine divided by 13? | 23 |
| 6 | Mary is embroidering tigers on her backpack. Each of her tigers has either 7 stripes or 6 stripes. If Mary embroiders 33 stripes, how many tigers are on her backpack? | 5 [tigers] |
| 7 | I can trade 5 leprechauns for 7 turtle monsters. How many turtle monsters will I get in return for trading 25 leprechauns? | 35 [turtle monsters] |
| 8 | Three sides of my square have a total length of 18 inches. In square inches, what is the area of my square? | 36 [sq. inches] |
| 9 | On a True-False test of 5 problems, Danny guesses randomly on each problem. Danny is X times as likely to get exactly one problem right as to get no problems right. What is X? | [X=] 5 |
| 10 | A 24-hour wall clock has the counting numbers 1 through 24 equally spaced in a circle. What number is directly opposite 17 on this clock? | 5 |

# "Math is Cool" Masters – 2011-12

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4th Grade – May 19, 2012

## COLLEGE KNOWLEDGE BOWL ROUND #4 - SET 4

| # | Problem | Answer |
|---|---|---|
| 1 | Find the value of 63 plus 36 plus 98. | 197 |
| 2 | Cakes A, B and C are all rectangular in shape and all have the same height. Measured in the same units, Cake A has length 9 and width 10, cake B has length 46 and width 2, and cake C has length 13 and width 7. Which cake has the greatest volume? Answer with a letter. | [cake] B |
| 3 | How many degrees are in a right angle? | 90 [degrees] |
| 4 | Stephanie can jump over three taco trucks at a time. How many jumps will she need to jump over 67 taco trucks? | 23 [jumps] |
| 5 | What is the mode of the following collection of values? 7, 7, 6, 5, 6, 5, 5 | 5 |
| 6 | Find the quotient when 576 is divided by 24. | 24 |
| 7 | Suzy sells socks in sets. Seven sock sets sell for 63 cents. Assuming a constant sock-to-cent ratio, how many **CENTS** will 16 sock sets sell for? | 144 [cents] |
| 8 | Ron has a 90-inch-long rope. He cuts the rope 9 times to make pieces of equal length. How many inches long is each little piece of rope? | 9 [inches] |
| 9 | Josh has 7 more Pokémon cards than Mark. Together they have 35 cards. How many cards does Josh have? | 21 [cards] |
| 10 | Face cards are kings, queens, and jacks. Caleb made a special deck of cards by discarding all clubs, face cards, and threes from a standard deck of cards. If a card is drawn at random from this new deck, what is the probability that it has an even number on it? Answer as a reduced fraction. | 5/9 |

# "Math is Cool" Masters – 2011-12

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4th Grade – May 19, 2012

## COLLEGE KNOWLEDGE BOWL ROUND #5 - SET 5

| # | Problem | Answer |
|---|---|---|
| 1 | Find the remainder when 248 is divided by 5. | 3 |
| 2 | Six ponies are carrying fairies to their kingdom. Each pony is carrying two fairies and each fairy is carrying five wands. How many total wands are there? | 60 [wands] |
| 3 | Round five thousand two-hundred eighty-one to the nearest hundred. | 5300 |
| 4 | How many of the first 10 counting numbers are prime? | 4 [numbers] |
| 5 | To make a peanut butter and jelly sandwich, you will need 1 scoop of peanut butter, 3 scoops of jelly and 2 slices of bread. If you have 20 scoops of peanut butter, 23 scoops of jelly and 31 slices of bread, how many complete sandwiches can you make? | 7 [sandwiches] |
| 6 | If Gerald Giraffe is 11 feet 11 inches tall, how many inches tall is Gerald? | 143 [inches] |
| 7 | Moritz has a seven-eighths chance of making a goal each time he tries. What is the expected number of goals he will make if he tries to shoot 24 goals? | 21 [goals] |
| 8 | A triangle has angles of 45 degrees, 62 degrees, and x degrees. Find the value of x. | [x=] 73 |
| 9 | In a barn of cows and chickens, there are 25 heads. Each chicken wears running shoes and each cow wears cowboy boots. All wear one shoe or boot per foot. If 26 running shoes are needed for the chickens, how many cowboy boots are needed for the cows? | 48 [cowboy boots] |
| 10 | Four times my number plus 5 is equal to 57 minus 12. What is my number? | 10 |

# "Math is Cool" Masters – 2011-12

Sponsored by:

4th Grade – May 19, 2012

## COLLEGE KNOWLEDGE BOWL ROUND #6 - SET 6

| # | Problem | Answer |
|---|---|---|
| 1 | If tomorrow is Thursday, what day was it 5 days ago? | Friday |
| 2 | Sonia is facing southwest. What direction will she be facing if she turns 180 degrees counterclockwise? | northeast |
| 3 | How many inches are in the perimeter of an octagon with side length 9 inches? | 72 [inches] |
| 4 | What is one-fourth of 360? | 90 |
| 5 | Biff has 323 more friends on Facebook than Eho does. Eho has 95 friends. How many friends does Biff have? | 418 [friends] |
| 6 | The angry birds are angry that their pig neighbors stole their eggs. In revenge, they launch themselves at the pig houses. If it takes 3 birds to destroy one pig house, how many birds would it take to destroy 21 pig houses? | 63 [birds] |
| 7 | Annie wants to get wants to get at least ten and a half hours of sleep after a long day, but she needs to wake up at 7 AM the next morning. What is the latest time she can go to sleep? | 8:30 PM |
| 8 | Julia likes to bake GIGANTIC cakes! Today she baked a cake made up of 12 equal slices with a total volume of 72 cubic miles. If Georgia the Giant ate two-and-a-half slices of the cake, what is the volume, in cubic miles, of the remaining cake? | 57 [cubic miles] |
| 9 | John swims at a speed of one-thousand, eight-hundred feet per HOUR. How many SECONDS will it take him to swim one hundred eighty feet? | 360 [seconds] |
| 10 | How many cubes of edge length 1 unit would it take to make a solid cube with edge length 3 units? | 27 [cubes] |

# "Math is Cool" Masters – 2011-12

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## COLLEGE KNOWLEDGE BOWL ROUND - EXTRA

| # | Problem | Answer |
|---|---|---|
| 1 | What is the median of the following collection of numbers? {1, 1, 4, 5, 6, 7, 7, 7, 10} | 6 |
| 2 | Jimmy Neutron can solve a Rubik's cube from start to finish in 3 SECONDS. How many Rubik's cubes can he solve in two HOURS? | 2400 [Rubik's cubes] |
| 3 | If Miya earns 1 pizza for every 7 books she reads, how many books will she need to read to earn 1 pizza every day for the month of June? | 210 [books] |

Final Score:

KEY

First Score

(out of 8)

# "Math is Cool" Masters – 2011-12

Sponsored by:

## 4th Grade – May 19, 2012

Name_____Team #_____ Room #_____

School Name _____ Proctor Name_____

## Mental Math Contest

**MENTAL MATH** - 30 seconds per question – 25% of team score

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

**DO NOT WRITE IN SHADED REGIONS**

| | Answer | 1 or 0 | 1 or 0 |
|---|---|---|---|
| 1 | 4 [inches] | | |
| 2 | obtuse | | |
| 3 | 16 | | |
| 4 | 9 [chickens] | | |
| 5 | 84 [cars] | | |
| 6 | [$] 10 or [$] 10.00 | | |
| 7 | 3/4 | | |
| 8 | 43 [numbers] | | |
| | | | |

# "Math is Cool" Masters – 2011-12

4th Grade – May 19, 2012

School Name_____Team #_____

Proctor Name_____Room #_____

Final Score:

KEY

First Score

(out of 20)

**TEAM MULTIPLE CHOICE - 15 minutes – 10 problems – 20% of team score**

*This test is the only test where you will be penalized for incorrect responses. You will receive 2 points for a correct letter response, 0 points for leaving it blank and -1 point for an incorrect response. When you are prompted to begin, tear off the colored sheet, pass out a copy of the test to each team member, and begin testing. Since this is a multiple choice test, ONLY a letter response should be listed as an answer on the answer sheet.*

**DO NOT WRITE IN SHADED REGIONS**

| Answer | | -1, 0 or 2 | -1, 0 or 2 |
|---|---|---|---|
| 1 | C | | |
| 2 | A | | |
| 3 | B | | |
| 4 | E [21.25] | | |
| 5 | A | | |
| 6 | D | | |
| 7 | C | | |
| 8 | D | | |
| 9 | A | | |
| 10 | D | | |
| | | | |

# "Math is Cool" Masters – 2011-12

4th Grade – May 19, 2012

School Name_____Team #_____

Proctor Name_____Room #_____

Final Score:

KEY

First Score

(out of 10)

**TEAM TEST - 15 minutes – 10 problems – 30% of team score**

*When you are prompted to begin, tear off the colored sheet and give a copy of the test to each of your team members and begin testing. Each problem is scored as **1 or 0**. Record all answers on colored answer sheet.*

**DO NOT WRITE IN SHADED REGIONS**

| | Answer | 1 or 0 | 1 or 0 |
|---|---|---|---|
| 1 | 7 [times] | | |
| 2 | 2 [3-pointers] | | |
| 3 | 30 [cents] | | |
| 4 | 6 PM | | |
| 5 | 71 [letters] | | |
| 6 | 15 [sq units] | | |
| 7 | 81649 | | |
| 8 | 31 | | |
| 9 | 13 | | |
| 10 | [$] 50 | | |
| | | | |

# "Math is Cool" Masters -- 2011-12

KEY

4th Grade – May 19, 2012

School:_____Team #_____

Proctor: _____ Room #_____

## RELAY # 1

| Answer for person # 1 | Answer for person # 2 | Answer for person # 3 | Answer for person # 4 |
|---|---|---|---|
| **15** | **4 [numbers]** | **64** | **169** |
| 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 |
|---|---|---|---|
| **260** | **2 [times]** | **8** | **24 [combinations]** |
| 1 or 0 | 1 or 0 | 1 or 0 | 2 or 0 |

| Final Score: |
|---|
| |

| First Score<br><br>(out of 8) |
|---|

# "Math is Cool" Masters – 2011-12

Sponsored by:

## 4th Grade – May 19, 2012

Name_____Team #_____Room #_____

School Name _____ Proctor Name_____

## Mental Math Contest

**MENTAL MATH** - 30 seconds per question – 25% of team score

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

**DO NOT WRITE IN SHADED REGIONS**

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

# "Math is Cool" Masters – 2011-12

## 4th Grade – May 19, 2012

School Name_____Team #_____

Proctor Name_____Room #_____

| Final Score: |
|---|
| |

| First Score |
|---|
| (out of 20) |

**TEAM MULTIPLE CHOICE - 15 minutes – 10 problems – 20% of team score**

*This test is the only test where you will be penalized for incorrect responses. You will receive 2 points for a correct letter response, 0 points for leaving it blank and -1 point for an incorrect response. When you are prompted to begin, tear off the colored sheet, pass out a copy of the test to each team member, and begin testing. Since this is a multiple choice test, ONLY a letter response should be listed as an answer on the answer sheet.*

**DO NOT WRITE IN SHADED REGIONS**

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

# "Math is Cool" Masters – 2011-12

4th Grade – May 19, 2012

School Name_____Team #_____

Proctor Name_____Room #_____

| Final Score: |
|---|
| |

| First Score |
|---|
| (out of 10) |

**TEAM TEST - 15 minutes – 10 problems – 30% of team score**

*When you are prompted to begin, tear off the colored sheet and give a copy of the test to each of your team members and begin testing. Each problem is scored as* ***1 or 0****. Record all answers on colored answer sheet.*

**DO NOT WRITE IN SHADED REGIONS**

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

# "Math is Cool" Masters – 2011-12

May 19, 2012

| Final Score: 1-15 | Final Score: 16-30 | Final Score: 31-40 |
|---|---|---|
| KEY | KEY | 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 | 3 [feet] | | |
| 2 | 1013 | | |
| 3 | 6 [squares] | | |
| 4 | 1 | | |
| 5 | 1200 [strokes] | | |
| 6 | 6.904 | | |
| 7 | 2 [ways] | | |
| 8 | 13 | | |
| 9 | 75 | | |
| 10 | 9001 | | |
| 11 | 4 | | |
| 12 | 152 [seconds] | | |
| 13 | 9 [mittens] | | |
| 14 | 16 [pints] | | |
| 15 | red | | |
| **1-15 TOTAL:** | | | |

| | Answer | 1 or 0 | 1 or 0 |
|---|---|---|---|
| 16 | 48 [anteaters] | | |
| 17 | 6:50 AM | | |
| 18 | 0 [prime numbers] | | |
| 19 | 1001 | | |
| 20 | 85 [days] | | |
| 21 | 18 [raisins] | | |
| 22 | [y=] 19 | | |
| 23 | 226 | | |
| 24 | 2.75 [lbs] | | |
| 25 | 10 [hurdles] | | |
| 26 | 6 [ways] | | |
| 27 | 18 | | |
| 28 | 6 [numbers] | | |
| 29 | 70 [apples] | | |
| 30 | 14 | | |
| **16-30 TOTAL:** | | | |

| | Answer | 1 or 0 | 1 or 0 |
|---|---|---|---|
| 31 | 50 [baseballs] | | |
| 32 | [$] 14.00 or [$] 14 | | |
| 33 | 9:36 PM | | |
| 34 | 15 [ways] | | |
| 35 | 248 [days] | | |
| 36 | 20 [paths] | | |
| 37 | 210 [blocks] | | |
| 38 | 112.5 [seconds] | | |
| 39 | 112 [cookies] | | |
| 40 | 155 [cents or ¢] | | |
| **31-40 TOTAL:** | | | |

4th Grade

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

# "Math is Cool" Masters – 2011-12

May 19, 2012

**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 | | | |
| 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:** | | | |

4th Grade