

"Math is Cool" Masters-2001-02

Sponsored by: IEEE - Wenatchee Section

4th Grade - May 11, 2002

Individual Contest

Leave answers in terms of π where applicable.

Do not round any answers unless stated otherwise.

Record all answers on the colored cover sheet.

1	Evaluate: $100010 - 90090$
2	What is the product of 123,870,000 and 0?
3	How many total legs would 3 cats and 4 chickens have?
4	At the "Academics are Cool" Survivor Camp, Eric found 14 equations in the woods while on his intellectual expedition. He decided to divide his equations evenly among his 7 tribe members. How many equations did each tribe member get?
5	One of the "Immunity Challenges" at Survivor Camp was to wrangle an "udderly amazing cow pi" and see how much milk they could extract in 5 minutes. The Trimathlete tribe got 5 gallons of milk, while the Mathletes got $3\frac{1}{2}$ gallons. How many more quarts did the Mathletes need to get in order to tie the Trimathletes?
6	John has 3 social studies books. If the first has 125 pages, the second has 75 pages, and the total number of pages is 325, how many pages does the third book have?
7	If there are 50 school buses and each can hold 24 children, how many children will it take to fill all of the buses?
8	Brittany wants the pony that costs \$500.00, but her mother is only willing to contribute \$200.00 to help pay for the pony. If Brittany earns \$25.00 a week, how many weeks will it take before she has enough money to pay the remaining cost of the pony?
9	What is the sum of all the odd numbers between 4 and 18?
10	If Silas and Powei played ultimate frisbee for 18 years, how many months did they play?
11	Sarah has been a crime detective for 3 times as long as Carl. If Carl has been a crime detective for 6 years, how many has Sarah been a crime detective?
12	How many sides does a nonagon have?

13	Tealah bought 10 pineapples for \$2.75 each and 5 tangerines for \$0.35 each. How much money, in dollars, did she pay?
14	True or False: $5 + 398 - 17 + 4 = 382$
15	Bob's family of 4 can eat 3 cans of tuna in a week. How many weeks would it take Bob's family to eat 21 cans of tuna?
16	If Marlee uses 7 pieces of paper for each assignment, how many pieces of paper does she use for 25 assignments?
17	If Trip is half of Chase's age and Chase is 10, how many years old will Trip be in 13 years?
18	If a roll of yarn can make half a sweater, how many rolls are required to make 22 sweaters?
19	What is the area of a square with a side length of 15?
20	Kent, Tyler, Brandt, and David line up to play four square at school. How many ways can they line up?
21	A lithium ion battery can operate a CD player for 12 hours. How many seconds can a lithium ion battery operate a CD player?
22	What is the product of 356 and 366?
23	What is the remainder when 4100 is divided by 8?
24	The Jazz Band is going to a Jazz Festival 837 miles away. After traveling 123 miles, they realize that Mark forgot his saxophone and must go back to get it. How many total miles was their trip to the Jazz Festival?
25	How many 45° angles are on the interior of a square with both diagonals drawn?
26	What is the product of the first six non-negative even numbers?
27	Kyle has \$900.00. Brasswind is having a sale for all trumpets. 4 trumpets cost \$500.00. 3 trumpets cost \$450.00. 2 trumpets cost \$350.00. 1 trumpet costs \$200.00. What is the maximum number of trumpets Kyle can buy?
28	Sarah has 4 identical pairs of white shoes, 5 identical pairs of red shoes, and 7 identical pairs of flip-flops. How many shoes should she pick to be sure of getting a matching pair? Right and left shoes are important.
29	Si-rex, Powei, Sister Mampson, Ohring, and Junior Bird Man are standing in a line. Si-rex is not in the front. There are exactly two people in front of Sister Mampson. Powei is directly behind Si-rex. Who is 4 th in line?

Challenge Questions

30	Each trumpet needs 3 valves, 1 bell, 3 valve slides, and 1 lead pipe. Wayne has 12 lead pipes, 11 bells, 39 valve slides, and 28 valves. How many trumpets can he build?
31	A beetle sits on each square of a 9x9 checkerboard. Each beetle can crawl diagonally to a neighboring square, leaving some squares empty and others with multiple beetles. What is the smallest possible number of empty squares after each beetle has moved exactly once?
32	Max weighs 156 lbs and carries 40 lbs in his backpack. Sarah weighs 105 lbs and carries 30 lbs in her backpack. Who carries the greater load in their backpack by percent of their body weight?
33	Caitlin drove from the Miss Moses Lake Pageant to home and returned along the same path. Her average speed going was 20 mph. Her average speed returning was 30 mph. What was her average speed, in mph, for the entire trip?
34	Tom Hanks is stranded on an island. He eats one fourth of his food supply on the first day. On the second day, he eats one fourth of the remaining food. On the third day, he eats one fourth of the remaining food. If he had $\frac{3}{4}$ of a pound left after the third day, how many pounds of food did he start with?
35	A ball is dropped 243 feet. Each time the ball hits the ground it bounces back up $\frac{2}{3}$ the height it has fallen. Find the total distance, in feet, traveled when the ball hits the ground the 5 th time.
36	The sum of the perimeters of three squares is 48 units. What is the smallest possible sum of their areas?
37	A group of people is standing in a circle spaced evenly apart. Each person is assigned a number starting with 1 and increasing in order as they go around the circle by 1. Each person is assigned only one number. It is noted that the person assigned the number 53 is standing directly across from the person assigned the number 123. What is the number assigned to the person standing directly across from the person assigned the number 80?
38	Two regular 6-sided dice were rolled and it was determined that the probability of rolling a sum of x was $\frac{1}{12}$. What is the sum of all possible values of x ?
39	At the Annual Math Open held at Cow Pi Beach, the Mathletes outnumbered the Trimathletes 7: x . If a competitor was chosen at random, the probability that it was a Trimathlete was $\frac{y}{12}$. What is the product of x and y ?
40	Abe pushed a boulder up a 40 foot hill. He pushes it 12 feet each day, and each night it rolls down x feet, where x is an integral value. Abe reached the top of the hill with the boulder on the 7 th day. What is the sum of all the possible values of x ?

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4th Grade, May 11, 2002

Team Multiple Choice Contest

Julie's Farm Fresh Eggs

Julie owns a small fresh egg business. She has 50 laying hens, of which 96% produce one egg per day. The rest do not produce. Of the eggs collected each day, 1 egg is not fit for selling. These eggs will be considered defective. Julie sells her eggs for \$1.50 per dozen and only sells a full dozen at a time.

For simplicity, assume months are 30 days long (one year is 360 days).

Costs			
Food		Miscellaneous	
Layena Crumbles	\$9.00 per 50 lb bag	Electricity	\$2.00 per month
Chicken Scratch	\$7.00 per 70 lb bag	Egg cartons (holds 1 dozen eggs)	\$0.25 each
Oyster Shell	\$14.00 per 40 lb bag		

Daily Food Rations for all 50 chickens
Each day Julie feeds her chickens: 2 lbs of Layena Crumbles 3 lbs of Chicken Scratch $\frac{1}{2}$ lb of Oyster Shell

Using the given information, solve the following questions:

1	How many pounds of Layena Crumbles does Julie feed her chickens each day? A) 4 B) 3 C) 2 D) 1 E) Answer not given
2	How many dollars would Julie spend a year on electricity? A) 21 B) 22 C) 23 D) 24 E) Answer not given
3	How many dollars would 210 pounds of chicken scratch cost? A) 21 B) 22 C) 23 D) 24 E) Answer not given
4	How many total eggs does Julie collect each day? A) 47 B) 48 C) 49 D) 50 E) Answer not given
5	How many pounds of food does Julie feed her chickens each month? A) 5.5 B) 60 C) 90 D) 15 E) Answer not given
6	Assuming the chickens eat equal amounts of food, how many pounds, does each chicken eat a day? A) .5 B) .11 C) .7 D) .9 E) Answer not given
7	If Julie were to sell one egg, how much would it cost to purchase? A) \$1.25 B) \$12.50 C) 1.25¢ D) 12.5¢ E) Answer not given
8	If Julie sells all of her non-defective eggs, how many cartons of eggs would Julie sell each month? A) 110 B) 117 C) 120 D) 127 E) Answer not given
9	How much does Julie spend each day to feed her chickens? A) \$30 B) 83.5¢ C) 30¢ D) \$83.5 E) Answer not given

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4th Grade - May 11, 2002

Team Contest

Leave answers in terms of π where applicable.

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1	Is 0 positive, negative, or neither?
2	Eho is thinking of a number. Biff asked the following yes/no questions and got the following answers: Is the number smaller than 50? Eho's answer: No Is the number larger than 50? Eho's answer: No What is the number?
3	What is the hundred thousands' digit of 9,876,543?
4	Biff and Eho were working on a math problem. Biff wrote $\begin{array}{r} 7\ 8 \\ +\ 9\ 0 \\ \hline \end{array}$ but miscopied the 0. Eho wrote $\begin{array}{r} 1\ 8 \\ +\ 9\ 3 \\ \hline \end{array}$ but miscopied the 1. What should the sum be?
5	A group of 35 Mathletes are planning a summer of intellectual fun. They decided to find the answers to 6300 math problems during the 45 days of summer. How many problems will each Mathlete need to solve each day if they wanted the number of problems evenly distributed among them?
6	Colin is flying to England on a Boeing 747 that travels at 250 geckles per hour. If the distance to England is 5,040 geckles, and a crosswind is slowing the plane by 10 geckles per hour, how many hours will it take him to get to England?
7	I am thinking of a number. If I add 3 to the number, then multiply the result by 3, then subtract 5 from the result, and at last, take the square root of the result the answer is 5. What is the number I am thinking of?

8	There are six "Math is Cool" teams in a championship. Each team will compete twice against each of the other teams. What is the total number of match-ups?
9	Mr. Sampson made a tile patio that was 15 tiles long and 12 tiles wide. When he finished, there was a sudden earthquake and a crack passed directly from the upper left corner directly to the bottom right corner. How many tiles did the crack pass through?
10	Out of 150 students, 54 are taking wood shop, 48 are taking arts and crafts, 12 are taking both wood shop and arts and crafts, 9 are taking both home economics and wood shop, 8 are taking both home economics and arts and crafts, 2 are taking all 3 classes, and 5 are not taking any. How many students are taking only home economics?

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4th Grade - May 11, 2002

Mental Math

Express all answers as fractions and in terms of radicals and π , where applicable, unless otherwise instructed.

Person 1		
1	What is the product of 4 and 3?	12
2	What is the perimeter of a triangle with sides of length 5, 6 and 7?	18
3	How many seconds are in 1 minute?	60 [seconds]
4	If one clown can hold 3 balloons, how many balloons can 11 clowns hold?	33 [balloons]
Person 2		
1	What is the quotient of 18 and 2?	9
2	What is the perimeter of a rectangle with sides of length 4 and 5?	18
3	How many minutes are in three hours?	180[minutes]
4	If the wool from 1 sheep can make 4 coats, then wool from how many sheep are needed to make 20 coats?	5[sheep]
Person 3		
1	What is sum of 37 and 4?	41
2	If the Beef family eats 15 hamburgers a day, how many hamburgers will they eat in one week?	105 [hamburgers]
3	How many days are in the longest month of the year?	31[days]
4	If it takes four people to make a team, how many people are needed to make 12 teams?	48 [people]
Person 4		
1	What is the difference of 45 and 34?	11
2	What is the perimeter of a regular pentagon with sides of length 4?	20
3	How many days are in a non-leap year?	365[days]
4	There are 16 cups of water in one gallon of water. How many cups of water are in four gallons of water?	64[cups]

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College Knowledge Bowl Questions #1

1	What is 3,993 rounded to the nearest hundreds place?	4000
2	Biff is 5 feet 3 inches tall. How many inches tall is Biff?	63[inches]
3	Amanda, Caleb, David and Grace were all born 2 years apart. The sum of their ages is 40. A year ago, Grace was half as old as Amanda was then. Caleb, who is 9, is younger than Amanda. How many years old is David?	11[years]
4	What is the greatest common factor of 12, 36 and 20?	4
5	A barrel contains 57,643 sardines. Some are gray and some are yellow. 10,472 are gray. How many sardines are yellow?	47,171 [sardines]
6	What is the product of all of the even numbers between 1 and 5?	8
7	Keisha wants to buy some roller skates that cost \$244.00. If her allowance is \$11.00 a week, how many weeks will it take before she has enough money to buy the roller skates?	23 [weeks]
	Extra Question: Only use it if needed	
8	What is the difference between 79,003 and 9,714?	69,289

4th Grade

"Math is Cool" Masters-2001-02

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4th Grade - May 11, 2002

College Knowledge Bowl Questions #2

1	Find the remainder when 7,821 is divided by 200.	21
2	A mouse ran on his wheel for 2 minutes and 10 seconds. How many total seconds did he run on his wheel?	130 [seconds]
3	Flip flops cost \$0.50 a pair to make. Shopko sells them for \$1.10 a pair. If 20 pairs of flip flops are sold, what is the profit in dollars?	[\$]12.00
4	Eho is the battery carrier for his math team. Each time a competitor's calculator has a battery failure, Eho must replace 4 batteries. If he started with 200 batteries at the beginning of a math competition and 32 competitors on his math team had battery failures, how many batteries did he have left at the end of the competition?	72 [batteries]
5	What is the sum of the ten thousands' digit and the hundreds' digit of 23,765? <u>Read number as:</u> 23 thousand 7 hundred sixty-five	9
6	Joe had 5 dozen eggs but broke two eggs trying get them all in the refrigerator. How many single unbroken eggs does he have now?	58 [eggs]
7	What is the sum of the next two numbers in the sequence? 17, 22, 27, 32.	79
	Extra Question: Only use it if needed	
8	If six people all shake hands with each other once, how many handshakes occur?	15

4th Grade

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4th Grade - May 11, 2002

College Knowledge Bowl Questions #3

1	What is the value in dollars of 7 quarters, 2 dimes, 11 nickels, and 9 pennies?	[\$]2.59
2	The sum of two consecutive odd numbers is 64. What is the biggest number?	33
3	What is the probability of drawing a red king or a club from a standard deck of cards?	15/52
4	What time is it 110 minutes before 3:10 p.m.?	1:20 p.m.
5	41 is 22 more than what number?	19
6	What is the sum of all the prime numbers greater than 30 and less than 39?	68
7	What is $92 + 92 + 92 + 108 + 108 + 108$?	600
	Extra Question: Only use it if needed	
8	What is the area of a square with a perimeter of 28?	49

4th Grade

"Math is Cool" Masters - 2001-02

4th Grade - May 11, 2002

School Name _____ Team # _____

Proctor Name _____ Room # _____

Final Score:

Full Name: _____

1st Score

Individual Contest - Score Sheet

DO NOT WRITE IN SHADED REGIONS

Out of 40

Answer		1 or 0	1 or 0
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

Answer		1 or 0	1 or 0
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
31			
32			
33			
34			
35			
36			
37			
38			
39			
40			

"Math is Cool" Masters - 2001-02

4th Grade - May 11, 2002

School Name _____ Team # _____

Proctor Name _____ Room # _____

Final Score:

Team Multiple Choice Contest-Score Sheet

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

1st Score

Out of 18

DO NOT WRITE IN SHADED REGIONS

Answer			
1			
2			
3			
4			
5			
6			
7			
8			
9			

"Math is Cool" Masters - 2001-02

4th Grade - May 11, 2002

School Name _____ Team # _____

Proctor Name _____ Room # _____

Final Score:

Team Contest-Score Sheet

DO NOT WRITE IN SHADED REGIONS

1st Score

Out of 10

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

"Math is Cool" Masters - 2001-02

4th Grade - May 11, 2002

School Name _____ Team # _____

Proctor Name _____ Room # _____

Final Score:

"Math is Cool" Masters -- 2001-02

4th grade - May 11, 2002

School Name _____ Team # _____

Proctor Name _____ Room # _____

Key

Full Name: _____

1st Score

Individual Contest - Score Sheet

DO NOT WRITE IN SHADED REGIONS

Out of 40

Answer		1 or 0	1 or 0
1	9920		
2	0		
3	20[legs]		
4	2 [equations]		
5	6 [quarts]		
6	125 [pages]		
7	1,200 [children]		
8	12 [weeks]		
9	77		
10	216 [months]		
11	18 [years]		
12	9 [sides]		
13	[\$]29.25		
14	False		
15	7 [weeks]		
16	175 [pieces]		
17	18 [years old]		
18	44 [rolls]		
19	225 [units ²]		
20	24 [ways]		

Answer		1 or 0	1 or 0
21	43,200 [seconds]		
22	130,296		
23	4		
24	1083 (miles)		
25	8 [angles]		
26	0		
27	6 [trumpets]		
28	17 [shoes]		
29	Si-rex		
30	9 [trumpets]		
31	9 [squares]		
32	Sarah		
33	24 [mph]		
34	16/9 or 1 7/9 [lbs]		
35	1023 [ft]		
36	48 [units ²]		
37	10		
38	14		
39	25		
40	7		

"Math is Cool" Masters -- 2001-02

4th grade - May 11, 2002

School Name _____ Team # _____

Proctor Name _____ Room # _____

Key

Team Multiple Choice Contest-Score Sheet

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

1st Score

Out of 18

DO NOT WRITE IN SHADED REGIONS

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

"Math is Cool" Masters -- 2001-02

4th grade - May 11, 2002

School Name _____ Team # _____

Proctor Name _____ Room # _____

Key

Team Contest-Score Sheet

DO NOT WRITE IN SHADED REGIONS

1st Score

Out of 10

	Answer	1 or 0	1 or 0
1	neither		
2	50		
3	8		
4	171		
5	4 [problems]		
6	21 [hours]		
7	7		
8	30 [match-ups]		
9	24[tiles]		
10	55 [students]		

"Math is Cool" Masters -- 2001-02

4th grade - May 11, 2002

School Name _____ Team # _____

Proctor Name _____ Room # _____

Key

Relay Contest - Score Sheet

Answer for relay #1
42
30
60
10
Answer for relay #2
16
36
4
39

"Math is Cool" Masters - 2001-02

4th Grade - May 11, 2002

Relay #1 Contest

Answer for person #1	Answer for person #2	Answer for person #3	Answer for person #4
42	30	60	10
1 or 0	1 or 0	1 or 0	2 or 0

Relay #2 Contest

Answer for person #1	Answer for person #2	Answer for person #3	Answer for person #4
16	36	4	39
1 or 0	1 or 0	1 or 0	2 or 0