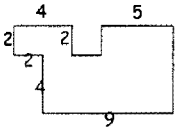
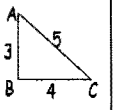
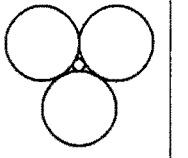
"Math is Cool" Masters-2003

4th Grade - May 10, 2003

Individual Contest

Express all answers as fractions unless stated otherwise.
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	Jon has 3/5 of an orange and Silas has 4/6 of an orange. Who has more?
2	What is the perimeter of the following polygon? 
3	Biff has 482 puppies. If he puts them in groups of 9, how many puppies would not be in a group of 9?
4	Julie, Seth, Joy and Tom need to sew costumes for the upcoming Halloween party. Julie needs 3 yards and 2 ft, Seth needs 9 ft, Joy needs 2 yards and Tom needs 4 yards and 1 ft of fabric. How many total yards of fabric will they need in total?
5	Evaluate: .99 - 1.07 ÷ 2.60 × .39
6	What is the area of a circle with diameter 10?
7	True or False: 52 x 87 = 4521.
8	True or False: A triangle with all equal sides is called an equilateral triangle.
9	Joe's school starts at 7:50 a.m. and ends at 2:40 p.m. Judy's school starts at 8:00 a.m. and ends at 3:00 p.m. If both have the same amount of time for lunch, whose school day is longer?
10	Evaluate: 29 x 479
11	Evaluate: $(1000 \div 1000) \times 0 \times (2 \times 3 \times 4 \times 5)$
12	Evaluate: 4/12 + 11/12 - 3/12
13	The sum of Bob and Joe's ages is 16. What will the sum of their ages be in 15 years?
14	In a group of 20 people, 7 are boys. What fraction of the people are girls?
15	What is the area of a square with perimeter 32?
16	How many even primes numbers are there?
17	If Bob can swim 45 feet, how many yards can he swim?
18	If John uses 7 pieces of paper to make one origami lantern, how many lanterns can he make from 91 pieces of paper?
19	Pat's age in years is 8 more than 5 times Caitlin's age. If Pat is 68, how old, in years, is Caitlin?
20	Joe finished his math test at 3:00 p.m. when the teacher called time. Tom was done at 2:49 p.m. How many seconds did Tom have to check his work before turning in his test?
21	What is the next prime number after 48?
22	Andy and Rebecca want to save up to buy a $50 computer game. Andy has 13 one dollar bills, 19 quarters, 29 dimes, 11 nickels and 39 pennies. Rebecca has 1 five dollar bill, 7 one dollar bills, 7 quarters, 17 dimes, 22 nickels and 77 pennies. If they put their money together, how much more, in dollars, will they need to purchase the computer?
23	If a game costs 25 cents per minute to play, how much, in dollars, does it cost to play for 12 minutes?
24	Find the smaller of two numbers whose sum is 30 and difference is 24.
25	Colin gave half his jelly beans to Josh, then gave half of his remaining jelly beans to Caitlin, then gave half of his remaining jelly beans to Eric and, finally, gave half of his remaining jelly beans to Lee. Colin has one jelly bean left. How many jelly beans did he start with?
26	What is the next number in the sequence? 1/3, 1/6, 1/12, 1/24...
27	If Jim needs to travel 54 miles, how fast, in miles per hour, must his average speed be if he wants to arrive in 3 hours?
28	The number 1991 is a palindrome because it reads the same backwards and forwards. What is the largest palindrome smaller than 1991?
29	What should be in the blank? 1 + 3 + 5 + 7 = 2 + 8 + 6 + ___
	Challenge Questions
30	Evaluate: $(6^2 \cdot 2 - 60)^2$
31	If the product of two numbers is 156 and their sum is 25, what is the difference between the larger number and the smaller number?
32	What is the sum of the first 20 positive odd integers?
33	I am thinking of a two-digit number. When I switch the digits I create a new number that is 9 less than my original number. My original number is divisible by 2, while my new number is prime. For the original number, how many two digit numbers fit this description?
34	Eight pounds of Green Apples cost $4.50. If Eho wants to by 1.5 tons of Green Apples, how much money, in dollars, does he need? (1 ton = 2,000 pounds)
35	Evaluate: 8!-7!+6!-5!-5!
36	Eric multiplied a number, x, by a constant to get 56. When he multiplied 7 by the same constant he got 49. What is the number x?
37	What is the smallest positive integer greater than 1 that is a perfect square, cube and fourth power?
38	A point is chosen at random from the interior of triangle ABC. What is the probability that it is closer to vertex C than vertices A and B? 
39	A circle with radius 6 is surrounded by 3 larger congruent circles, so that every circle touches all 3 other circles. What is the radius of the larger circles? 
40	Two identical carafes, labeled A and B, are filled 2/3 full, carafe A with red sand and carafe B with green sand. Carafe B is poured into carafe A until it is full. Carafe A is then poured into B until B is filled. Finally, B is poured back into A until A is full. Assume that the sand is mixed thoroughly after every transfer. What is the ratio of red sand to green sand in carafe A after the final transfer?

"Math is Cool" Championships-2003

Sponsored by:

4th Grade - May 10, 2003

Team Multiple Choice Contest

Parabolic Peak has a ski and snowboard park constructed on it. It has 5 ski lifts and 22 different runs. Ski lifts run at different speeds. Amateurs use the ski lifts on runs of less difficulty. The ski lifts on these runs have a slower speed than the ski lifts that serve the more experienced skiers. The more experienced skiers like the more difficult runs. The following is data on the ski lifts:

Ski Lift Name	Speed	Total number of chairs on ski lift	Number of passengers per chair	How many passengers can ride per hour	Length of chair lift in one direction in feet
Powder Puff	4 mph	50	2	1056	1000
The Denominator		80	4	2112	2000
Inferno	10 mph		6	4752	4000
Vertical Limit	12 mph	120		6336	3000
Vertex Locator	15 mph	75	1		2500

Questions:

1	What is the speed of the Inferna ski lift? A) 4 mph B) 10 mph C) 12 mph D) 15 mph E) Answer not given
2	How many different runs are on Parabolic Peak? A) 12 B) 5 C) 7 D) 11 E) Answer nat given
3	How many feet of cable are used in the Powder Puff Ski Lift? A) 2000 ft B) 3000 ft C) 4000 ft D) 5000 ft E) Answer not given
4	How many feet apart are the chairs on the Powder Puff Ski Lift? A) 20 ft B) 30 ft C) 40 ft D) 50 ft E) Answer not given
5	How many passengers can ride the Vertical Limit Ski Lift in 3.5 hours? A) 6336 B) 12000 C) 18842 D) 21700 E) Answer not given
6	If the speed of the Powder Puff Ski lift was increased to 8 mph, how many passengers could ride the chair lift in 2 hours? A) 2000 B) 4123 C) 4244 D) 4512 E) Answer not given
7	What is the total number of feet of Cable on Parabolic Peak? A) 20000 B) 22000 C) 25000 D) 28000 E) Answer not given
8	It costs $100 per foot in one direction to build a ski lift. How much, in dollars, did it cost to build all 5 ski lifts on Parabolic Peak? A) $832 B) $729,000 C) $455,000 D) $124,000 E) Answer not given
9	What is the speed of The Denominator Ski Lift? A) 4 mph B) 5 mph C) 6 mph D) 7 mph E) Answer not given

"Math is Cool" Masters-2003

Sponsored by:

4th Grade - May 10, 2003

Team 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	A binder is one and one-half inches thick. In feet, how thick are 24 binders stacked together?
2	The sum of 5 consecutive numbers is 260. What is the smallest number?
3	Mike is driving 2000 miles to the National Math Championship. If the gas tank in Mike's car holds 10 gallons and the car travels 15 miles per gallon of gas, what is the fewest number of times Mike must put gas into his gas tank to make this trip? Assume that the gas tank is empty at the start of the trip.
4	Tom plays 6 strings on the guitar per chord. If he plays 264 strings total in one song, how many chords did he play?
5	Susan has math homework to do. The first night she completes $\frac{1}{2}$ of the problems. The second night she completes $\frac{1}{2}$ of the remaining problems. What percent of the original problems must Susan still complete?
6	The area of a rectangle is 39. What is the area of a triangle with the same height and base as this rectangle?
7	Which is larger: 14/27 or 15/29?
8	The ratio of boys to girls in Professor Bill's classes is 13:19. If Bill has 10 classes, each with 128 students, how many girls are in all of his classes?
9	Dan has $3.16, all in coins. What is the greatest number of nickels he could have?
10	Evaluate: $1 + 3 \times 5 - 6 \div 2$

4th grade

Relay 1 Person #1 If there are 30 students in a classroom and they split up into groups of 5, how many groups are there?
Relay 1 Person #2 If it is TNYWG minutes after six o'clock p.m., how many minutes will pass before 7:15 p.m.?
Relay 1 Person #3 If you had TNYWG cents and a candy bar costs 23 cents, haw many candy bars can you buy?
Relay 1 Person #4 How many distinct ways can TNYWG people stand in a line?
Relay 2 Person #1 How many people can 24 cookies feed if each person gets 2 cookies?
Relay 2 Person #2 How many yards are in TNYWG feet?
Relay 2 Person #3 If Libbey reads TNYWG pages of her book each night and it takes her 24 nights to finish the book, how many pages are there total in her book? (Assume the number of pages in the book is a multiple of 4)
Relay 2 Person #4 What is the probability of getting a head on the TNYWGth toss of a coin?

"Math is Cool" Masters-2003

4th Grade - May 10, 2003

Mental Math Contest

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

Person #1		
1	How many seconds are in 5 minutes?	300 [seconds]
2	What is the area of a square with side length 8?	64
3	What is the remainder when you divide 25 by 6?	1
4	What is largest prime number smaller than 100?	97
Person #2		
1	What is 1/5 plus 1/4?	9/20
2	Sam has 50 baseball cards. If he gives 3 to each of his 5 friends, how many cards does he have left?	35 [cards]
3	How many yards are in a mile?	1760 [yards]
4	What is the perimeter of a hexagon with side length 4?	24
Person #3		
1	What is the perimeter of an equiloteral triangle with side length 15?	45
2	What is 5 times 6 times 3?	90
3	What is 1/9 of 54?	6
4	Carl puts 3 ane dollar bills into a machine that gives back the equivalent amount of money in nickels. How many nickels will he get back?	60 [nickels]
Person #4		
1	Buckshot is 72 inches tall. How tall is he in yards?	2 [yards]
2	Bob has 32 marbles. If he gives half of them oway and then receives a dozen mare, how many does he have?	28 [marbles]
3	What is the perimeter of a rectangle with sides of length 4 and 7?	22
4	What is the sum of the first 4 prime numbers?	17

"Math is Cool" Masters-2003

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4th Grade - May 10, 2003

College Knowledge Bowl Questions #1		
1	How many handshakes occur if everyone on a 4 person team shakes everyone else's hand once?	6[handshakes]
2	Sean worked for $2\frac{1}{2}$ hours, Jill worked for 30 minutes, and Suzanne slept until noon but came into the Burger Teen at 1:00 p.m. and worked until closing at 5:00 p.m. How many total hours did they work?	7 [hrs]
3	Find the quotient of 121 and 11.	11
4	Jan's parents are 32 and 34 years old. Elliot's parents are 41 and 27. Joe's parents are 29 and 33. The sum of whose parents' ages is the greatest?	Elliot's
5	If today is Saturday, two days after the day after tomorrow is what day?	Wednesday
6	If the ratio of boys to girls in Mr. Sampson's class is 2:3 and there are 10 boys, how many girls are there?	15[girls]
7	Round 9950 to the nearest hundreds place.	10,000
Number ***8*** is an extra question. Only use it if needed.		
8	The first ferry leaves for Seattle at 5:30 a.m. Every 55 minutes another ferry leaves. What time does the 8th ferry of the day leave for Seattle?	11:55 a.m.

"Math is Cool" Masters-2003

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4th Grade - May 10, 2003

College Knowledge Bowl Questions #2		
1	If A = 9 and B = 7, evaluate: A + B + B + B	30
2	How many sides does an nonagon have?	9
3	Abe grows 2 inches each year. How tall, in inches, will he be in 5 years if he is already 6 feet tall and continues to grow at that rate?	82 [in]
4	Mae is 13 days older than Tim. If today is Tim's birthday, how many days will pass until Mae's birthday? Assume it is not a leap year.	352 [days]
5	Joe likes to collect baseball cards. He has been collecting for 39 months. Sam likes to collect baseball cards, too, and has been collecting for 3 years, 2 months. If they collect cards at the same rate, who has the most cards?	Joe
6	I flip 3 coins, what is the probability they all land heads up?	1/8
7	Evaluate: 9 times 8 times 7 divided by 7	72
Number ***8*** is an extra question. Only use it if needed.		
8	How many distinct ways can the letters in the word "teams" be arranged?	120[ways]

"Math is Cool" Masters-2003

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4th Grade - May 10, 2003

College Knowledge Bowl Questions #3		
1	Lee is going to get his driver's license in 1 day, 9 hours and 23 minutes. In how many minutes will Lee get his driver's license?	2003 [min]
2	The sum of Josh and Mikes ages is 20 years. In ten years what will the sum of their ages be, in years?	40[years]
3	Evaluate: 26 times 27	702
4	What is the sum of the first 5 positive odd numbers?	25
5	Colin and Abram took the SAT. Colin scored 1600 and Abram scored 3/4 of what Colin scored. What was Abram's score?	1200
6	In a field of cows and chickens there are 100 feet and 30 heads. How many cows are present?	20 [cows]
7	A llama can haul 45 pounds of gear into the wilderness. How many pounds of gear can 6 llama's haul into the wilderness?	270 [pounds]
Number ***8*** is an extra question. Only use it if needed.		
8	What is the first number after one to be both a perfect square and a perfect cube?	64

"Math is Cool" Masters -- 2003

4th grade - May 10, 2003

School Name_____Team #_____

Proctor Name_____Room #_____

Key

Full Name:_____

1st Score

Out of 40

Individual Contest - Score Sheet

DO NOT WRITE IN SHADED REGIONS

	Answer	1 or 0	1 or 0
1	Silas		
2	38		
3	5[puppies]		
4	13 [yds]		
5	2.91		
6	25π		
7	False		
8	True		
9	Judy's		
10	13,891		
11	0		
12	12/12 or 1		
13	46		
14	13/20		
15	64		
16	1		
17	15[yards]		
18	13[lanterns]		
19	12[years]		
20	660 [sec]		

	Answer	1 or 0	1 or 0
21	53		
22	[$]11.09		
23	[$]3.00		
24	3		
25	16[jelly beans]		
26	1/48		
27	18 [mi/hr]		
28	1881		
29	0		
30	144		
31	1		
32	400		
33	3		
34	$1687.50		
35	35,760		
36	8		
37	4096		
38	1/4		
39	$12\sqrt{3} \div 18$		
40	14:13 or 14/13		

"Math is Cool" Masters -- 2003

4th grade - May 10, 2003

School Name_____Team #_____

Proctor Name_____Room #_____

Key

Team Multiple Choice Contest-Score Sheet

1st Score

Out of 18

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

DO NOT WRITE IN SHADED REGIONS

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

"Math is Cool" Masters -- 2003

4th grade - May 10, 2003

School Name_____Team #_____

Proctor Name_____Room #_____

Key

1st Score

Out of 10

Team Contest-Score Sheet

DO NOT WRITE IN SHADED REGIONS

	Answer	1 or 0	1 or 0
1	3 [feet]		
2	50		
3	14 [times]		
4	44 [chords]		
5	25 [%]		
6	39/2 or 19.5 or 19 1/2		
7	14/27		
8	760 [girls]		
9	63 [nickels]		
10	13		

"Math is Cool" Masters -- 2003

4th grade - May 10, 2003

School Name_____Team #_____

Proctor Name_____Room #_____

Key

Relay Contest - Score Sheet Relay #1

Answer for person #1	Answer for person #2	Answer for person #3	Answer for person #4
6	69	3	6
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
12	4	96	$\frac{1}{2}$
1 or 0	1 or 0	1 or 0	2 or 0