

"Math is Cool" Championships -- 2002-03

5th Grade - March 14, 2003

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			
2			
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Answer			
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"Math is Cool" Championships-2002-03

5th Grade - March 14, 2003

Individual Contest

Express all answers as reduced 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	What is the sum, in degrees, of the interior angles of a triangle?
2	What is the smallest prime factor of 45?
3	Evaluate: $1 + 2 + 3 + \dots + 12 + 13 + 14$.
4	Evaluate: 8.34×2.63
5	Find the remainder when 5732 is divided by 6.
6	Reduce: $60/84$
7	Express $5/32$ as a decimal.
8	Evaluate: 248×98 .
9	Evaluate: $54321 - 43215$
10	Evaluate: $3,238,601 + 183,628$.
11	If an 8 member math team shakes each other's hands exactly once, how many handshakes take place?
12	What is 90% of 150?
13	What is the area of a triangle with base 12 and height 8?
14	What is the largest prime factor of 513?
15	Daniel and Kyl are going on a road trip. After looking at a map, they determine it will take 1250 hours. How many full days will they travel?
16	Whitney has 4 pies: apples, cherry, pumpkin, and banana cream. In how many ways can these pies be arranged in a straight line?
15	The bank bails Lauren out a debt of \$10,000. The interest rate is 3% per year. After 1 year, how much interest is owed in dollars?
18	Two positive numbers differ by one. One has 3 digits, the other has 4 digits. What is the sum of these numbers?
19	How many prime numbers between 30 and 120 have a one's digit that is 2?
20	Caitlin scores a goal on 2 out of every 3 of her shots in soccer. In a game, she shoots 6 shots. How many goals does she make?
21	Thirty widgits weigh the same as 50 wrenches. How many wrenches weigh the same as 45 widgits?

22	An integer is between 99 and 999, inclusive. What is the smallest possible product of all its digits?
23	There are 1250 socks in a drawer. If 414 of them are orange, how many pairs of orange socks are in the drawer?
24	Atomic Fireballs cost \$0.14 at Sampson's Quik-e Mart. Lauren has 93 cents. How many fireballs can she buy?
25	A skier has 2 skis and a snowboarder has 1 snowboard. Each ski and snowboard is considered a "plank." If there are 13 skiers and 17 snowboarders, what is the maximum number of "planks" there could be?
26	What is the first year after 2003 in which all the digits are prime?
27	Jon Merck rolls 2 six-sided, normal dice. What is the greatest quotient possible of one die divided by the other?
28	How many whole numbers from 0 - 100 have at least one digit that is a 5?
29	What is the probability of flipping a head or a tail with a fair coin?

Challenge Questions

30	Colin is standing on point "a" on a circle. Lee is standing on point "b" on the same circle, which is directly across from "a" such that when the two points are connected, the line forms the diameter of the circle. If the circle's circumference is 10π meters, how far apart are Colin and Lee in meters?
31	What is the length of the hypotenuse of a right triangle if one leg is 3 yards long and one leg is 4 yards long?
32	It takes Aron Bender 6 hours to mow a 100 ft^2 lawn. How many such lawns did he mow if he spent 15 hours mowing?
33	Kyl has a constant craving for Top Ramen noodles. If he can eat his body weight, 95 pounds of fighting fury, every two days, how many pounds will he eat in a week?
34	Aaron convinces Kyl to challenge Whitney to a boxing match. Secretly, Aaron plans to bet on Whitney, who has a 60% chance of beating Kyl. What are the <u>odds</u> in favor of Kyl winning and Aaron losing his money? Express answer as a ratio.
35	Joe is making a cookie for each of his 5 th grade class mates. He can make one cookie per minute and there are 671 5 th graders. How many seconds will it take him to make a cookie for each classmate?
36	If the ratio of side lengths of two cubes is 2:3 and the volume of the smaller cube is 64, what is the volume of the larger cube?
37	The probability that Aaron sees Hannah on any given day is $\frac{1}{2}$. What is the probability that he sees her 3 out of all 5 days this week?
38	I have 120 meters of fence. What is the largest possible area I can enclose? Leave answer in terms of π .
39	Libbey, Keisha, Lee, Max and Paul are standing in a line. Libbey and Keisha refuse to be first or last and insist on standing next to each other. How many ways can the five kids stand in line?
40	Sampson and Merck are harvesting wheat. Merck can harvest one acre in 13 hours and Sampson can harvest one acre in one hour. How long, in hours, does it take them working together to harvest one acre?

"Math is Cool" Championships -- 2002-03

5th Grade - March 14, 2003

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			
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"Math is Cool" Championships-2002-2003

5th Grade - March 14, 2003

Team Multiple Choice Contest

An amusement park opens its gates at 8:30 a.m. and all the roller coasters start their first run at 9:00 a.m. each morning. In the evening the roller coasters stop at 10:00 p.m. and the riders get out, leave, and the park locks its gates at 10:30 p.m. The park has five roller coasters and 12 roller coaster rides run every hour. The median number of seats on the roller coasters is 20 and the mean number of seats is 24. Roller coaster A has more seats than roller coaster C.

Ride	Seats	Average number of riders each run	Run Time	Total Time to Unload and Load
A	?	20	20 minutes	10 minutes
B	10	8	12 minutes	8 minutes
C	?	7	?	15 minutes
D	40	32	25 minutes	5 minutes
E	38	33	10 minutes	10 minutes

Questions

1	Which roller coaster takes the longest to unload and load? A) Ride A B) Ride B C) Ride C D) Ride D E) Ride E
2	How many times does roller coaster A run each hour? A) 2 B) 1 C) 4 D) 3 E) Answer not given
3	Which two roller coasters run 3 times per hour? A) Rides A and B B) Rides B and C C) Rides C and E D) Rides B and D E) Rides B and E
4	What is the run time, in minutes, for roller coaster C? A) 30 B) 20 C) 15 D) 10 E) 5
5	How many minutes a day are spent unloading and loading roller coaster E? A) 130 B) 260 C) 780 D) 390 E) Answer not given
6	A ticket costs a dollar. Each ride takes a ticket. On average, how many dollars does the amusement park make a day on roller coaster rides? A) \$2182 B) \$3768 C) \$3744 D) \$3133 E) Answer not given
7	Express, as a percentage, the number of roller coaster seats filled each day. A) 70% B) 80% C) 85% D) 100% E) Answer not given
8	What roller coaster has the least percentage of its seats filled throughout the day? A) Ride A B) Ride B C) Ride C D) Ride D E) Ride E
9	On average, what is the total number of people that ride roller coaster D or E in a given hour? A) 163 B) 65 C) 162 D) 194 E) 130

"Math is Cool" Championships -- 2002-03

5th Grade - March 14, 2003

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			
2			
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10			

"Math is Cool" Championships-2002-03

5th Grade - March 14, 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	Marianne has 3 shirts, 2 pairs of pants, 9 hair ties and 6 shades of lipstick. Assuming she wears 1 shirt, 1 pair of pants, 1 hair tie, and 1 shade of lipstick, how many outfits can she make?
2	Evaluate 6^4 .
3	Find the next term in the sequence: 1, 2, 4, 8, ____
4	What is the product of the sum of 2 and 3 and the sum of 3 and 4?
5	Solve for x: $15x = 3!$
6	$\frac{2(9 - 8) + 7^2}{4(5^2 - 15)}$ Express as an improper fraction.
7	$21 + 24 + 27 + \dots + 150 + 153 + 156$
8	Aaron is a cellist. In one measure of a piece Aaron plays, the first note is $\frac{1}{8}$ th of a measure, the second note is $\frac{1}{2}$ of a measure, and the third note is $\frac{1}{4}$ th of the measure. Assuming that all of the note lengths must add up to one measure, how long must the fourth and final note Aron plays be?
9	Find the value of $x + y$. $5x + 9 = 59$ $2y = -20$
10	If I flip a coin 97 times and get heads each time, what is the probability of getting heads the 98 th time?

5th

Practice relay Person#1 $16 + 40$
Practice relay Person#2 $TNYWG \div 7$
Practice relay Person#3 $TNYWG \text{ times } 4$
Practice relay Person#4 $TNYWG \div 2$
Relay #1 Person#1 Simplify: 2×3^3
Relay#1 Person#2 $TNYWG/9$
Relay#1 Person#3 Find $\frac{1}{2}$ of TNYWG
Relay#1 Person#4 Square TNYWG
Relay#2 Person#1 Find the area of a triangle with base 6 and height 10
Relay#2 Person#2 Find the radius of a circle with diameter TNYWG
Relay#2 Person#3 Find the area of a square with side length TNYWG
Relay#2 Person#4 Find TNYWG-216

"Math is Cool" Championships -- 2002-03

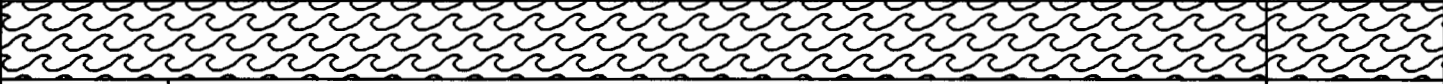
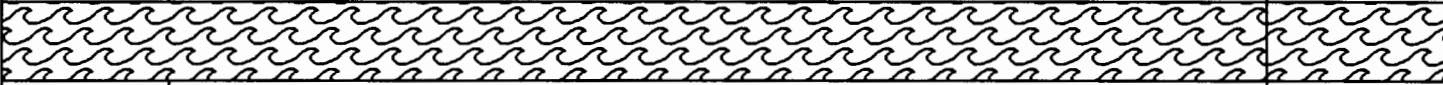
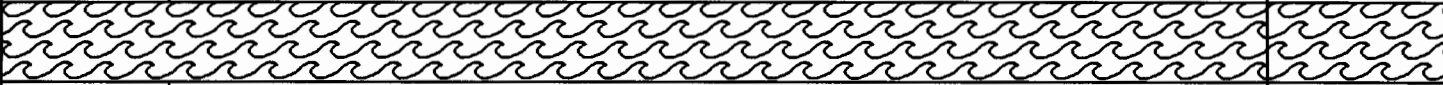
5th Grade - March 14, 2003

Final Score:

School Name _____ Team # _____

Proctor Name _____ Room # _____

Mental Math - Score Sheet

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"Math is Cool" Championships-2002-03

5th Grade - March 14, 2003

Mental Math Contest

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

Person #1		
1	What is 6×8 ?	48
2	What is $1,000 - 100 - 10 + 1$	891
3	48 inches is how many feet?	4
4	What is 12×12 ?	144
Person #2		
1	How many sides does a pentagon have?	5
2	What is $210 - 29$?	181
3	What is the perimeter of a square with side length 7?	28
4	2 hours and 45 minutes before noon is what time?	9:15 am
Person #3		
1	How many feet are in 72 inches?	6
2	How many cookies are in 3 dozen?	36
3	What is $10+9-8+7-6+5$?	17
4	What is 10×12 ?	120
Person #4		
1	What is $150 + 94$?	244
2	What is $\frac{1}{8}$ of 72?	9
3	What is the difference between 215 and 65?	150
4	What is the product of 20 and 25?	500

"Math is Cool" Championships-2002-03

5th Grade - March 14, 2003

College Knowledge Bowl Questions #1

1	Cojo and Manco are running a race. Cojo finishes $\frac{1}{4}$ hour after 3 o'clock and Manco finishes $\frac{1}{4}$ hour before 2 o'clock. How many minutes pass from when Manco finishes to when Cojo finishes?	90 [min]
2	What is the product of the reciprocal of 5 and the reciprocal of $\frac{1}{5}$?	1
3	Sampson has 3 dozen eggs. He sells 5 eggs to Corr and 6 eggs to Walther, but Walther returns 2 of his eggs. How many eggs does Sampson have left?	27 [eggs]
4	Apollo has 10 coins for a total of 30 cents. How many pennies does he have?	5[pennies]
5	What is the perimeter of an equilateral triangle with side length 4?	12
6	What is the quotient of the sum of the first 5 prime numbers and 4?	7
7	Paul has 8012 quarters. How many total dollars does he have?	2003[dollars]
Number <u>8</u> is an extra question. Only use it if needed.		
8	Colin and Lee are five miles apart. Lee is walking towards Colin at 2 mph and Colin is walking towards Lee at 3 mph. How much time will pass until they meet?	1 hour

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5th Grade - March 14, 2003

<u>College Knowledge Bowl Questions #2</u>		
1	Megan has red hair that grows 3 cm every 2 months. At the beginning of February, it was 30 cm long. She cut 10 cm off in June. How long is it at the end of September?	32 [cm]
2	If Berde knows $\frac{2}{3}$ of all the sophomore girls and he enters a sophomore classroom with 18 girls, how many of them will he know?	12[girls]
3	What is the sum of the exterior angles of a nonagon?	360[°]
4	How many degrees are between the minute and hour hands of a clock at 3:00 am?	90[°]
5	What is the product of the first three prime numbers?	30
6	Evaluate when $x = 2$. $2x + 2$.	6
8	If Colin has 5 dollars and wants to buy as many 35 cent yo-yo's as possible, how many can he buy?	14
Number 8 is an extra question. Only use it if needed.		
7	What is 15% of 50?	7.5

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<u>College Knowledge Bowl Questions #3</u>		
1	If it is now 3 hours and 20 minutes before 5:30 PM, what time is it?	2:10 pm
2	What is the largest whole number I can add to the sum of 8 and 9 and get a number that is less than 30?	12
3	Josie pours one quart from a full gallon container of water. How many pints are left in the container?	6[pints]
4	The ratio of Freshmen to Juniors in the zero hour math class is 5 to 3. If 2 Freshmen and 2 Juniors are missing, then the ratio of Freshmen to Juniors becomes 2 to 1. How many freshmen are in the class when everyone is there?	10 [Freshman]
5	I am thinking of a number that is not zero. When I multiply my number by 25%, I get the same answer as when I divide my number by what?	4
6	Helen has 5 U.S. coins. No three of them are the same. What is the smallest number of cents Helen could have?	22[¢]
7	A meter is slightly longer than a yard. Is a foot longer or shorter than 25 centimeters?	Longer
Number <u>8</u> is an extra question. Only use it if needed.		
8	What is the smallest counting number I can add to 58 to get a sum that leaves no remainder when divided by 7?	5

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School Name _____ Team # _____

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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	180[°]		
2	3		
3	105		
4	21.9342		
5	2		
6	5/7		
7	0.15625		
8	24304		
9	11106		
10	3,422,229		
11	28[handshakes]		
12	135		
13	48		
14	19		
15	52[days]		
16	24[ways]		
17	[\$]300		
18	1999		
19	0		
20	4 [goals]		

	Answer	1 or 0	1 or 0
21	75 [wrenches]		
22	0		
23	207 [pairs of orange socks]		
24	6 [fireballs]		
25	43 [planks]		
26	2222		
27	6		
28	19		
29	1 or 100% or certain		
30	10 [meters]		
31	5 [yards]		
32	2.5 [lawns] or 2½		
33	332.5 [pounds]		
34	2:3		
35	40,260[seconds]		
36	216		
37	5/16		
38	3600/π[meters ²]		
39	24		
40	13/14[hours]		

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

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5th grade - March 14, 2003

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Key

1st Score

Team Contest-Score Sheet

DO NOT WRITE IN SHADED REGIONS

Out of 10

	Answer	1 or 0	1 or 0
1	324[outfits]		
2	1296		
3	16		
4	35		
5	$\frac{2}{5}$ or .4		
6	$\frac{51}{40}$		
7	4071		
8	$\frac{1}{8}$ [of a measure]		
9	0		
10	$\frac{1}{2}$		

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School Name _____ Team # _____

Proctor Name _____ Room # _____

Key

Relay Contest - Score Sheet

Practice relay
56
8
32
16
Answer for relay #1
54
6
3
9
Answer for relay #2
30
15
225
9