

"Math is Cool" Championships-2003-04

Sponsored by: IEEE - Wenatchee Div

5th Grade -March 12, 2004

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	Find the missing value: $8 + \underline{\quad} = 11$
2	Evaluate 5×25
3	Evaluate $36 \div 9$
4	Find the product of $4' 3$ and $3' 4$
5	As a percentage, what is the probability of a coin landing on heads if it is only flipped once?
6	What is the perimeter of a square with side length 15 feet?
7	$1.08 + .92$
8	Place $<$, $>$, or $=$ in the blank to make a true statement: $2/8 \underline{\quad} 1/8$
9	Round to the nearest one-thousandth: 29.16759
10	What is $1' 3$ of 42?
11	Find the next number in the following sequence: 2, 6, 18, $\underline{\quad}$
12	Libbey and Keisha belly dance on Thursdays. Libbey can shimmy at a rate of 5 shakes per second and Keisha can shimmy at a rate of 7 shakes per second. How many more shakes will be in Keisha's shimmy than Libbey's if they shimmy for one minute?
13	A can of peaches cost 87 cents. How much will it cost, in dollars, to buy 12 cans?
14	What is 30% of 90?
15	Write the equivalent fraction for 20%.
16	Write two hundred sixty seven thousand three hundred thirty eight using numbers.

17	Simplify the expression (leave as a reduced, improper fraction): $\frac{2 \times 3 + 5 - 2}{2}$
18	Find the mean of the following data set: 13, 12, 19, 15, 16
19	How many zeros would it take to write the product of 1000 and 100?
20	The perimeter of a rectangle with integer side lengths is 16 units. If the area of the rectangle is 16 units ² , find the number of units in the length of the longest side.
21	How many counting numbers are there from 49 through 87 inclusive?
22	There are 10 girls and 14 boys in French Club. Express the ratio of boys to girls in the club in simplest terms.
23	The product of negative 7 and a certain number n is 287. What is n ?
24	If the day before the day before yesterday was Tuesday, what day will it be 20 days from tomorrow?
25	The low temperature yesterday was negative 4° C. Today the low temperature dropped by 5° C. Find today's low temperature, in degrees C.
26	Alice draws a regular pentagon 9 inches on a side. Betty draws a regular hexagon 8 inches on a side. What is the positive difference between the perimeters of the two geometric shapes?
27	What number added to 11 gives a sum of negative 6?
28	Find the sum of the distinct or different prime factors of 60.
29	Brian has a lucky number. It has two digits. It is divisible by five. The product of the digits is not zero. It is greater than 20, and it has one digit that is a perfect cube. What is Brian's lucky number?
30	If I multiply my number by 6 and add 4, the result is 64. What is the cube of my number?

Challenge Questions

31	How many more arrangements of all the letters of COLD are there than of all the letters of HOT?
32	The semi-perimeter of a regular hexagon is 87 units. Find the number of units in the length of each side.
33	Kelly and Keisha run the Luna Observation Center outside Mexico City. 0E is at the eastern horizon and 180E is at the western horizon. If the moon rises at 6 pm and sets at 6 am, to what degree will the telescope be pointing to see the moon at midnight?
34	Keisha and Libbey go on a Ronny Safari at Northtown Mall for two hours. It takes them 2 minutes to search each store and they find him in the 30 th store. They talk with him for the remaining 60 minutes they had planned to use to search the rest of the mall. How many total stores are in the mall?
35	Fourteen people stand in a circle counting starting with one. If Maggie says three the first time around, what number will she say the third time around?
36	Keisha is covering the front of her notebook with gum wrappers. If her notebook is 12 inches by 9 inches and she has it $\frac{2}{3}$ covered, what is the area, in inches squared, of her notebook covered in wrappers?
37	It takes Brittney ten minutes to tie one shoe and two extra minutes if she wants to double knot it. Both of her shoes come untied once in every hour if she doesn't double knot them. If she doesn't double knot her shoes, how many minutes would she have saved in five hours by double knotting her shoes the first time?
38	If $a \# b = b^2 \left(\frac{a+b}{a-b} \right)$, what does $(4 \# 2) \# 8$ equal?
39	Find the mean of the median and mode of the following data set: 7, 11, 5, 5, -1, 7, 3, 7, 1
40	Keisha and Kelly have an astronomy club devoted to observing the moon. If the moon is visible 28 out of 29 days and the girls can make it outside 14 days per 29 days, what is the probability they will go out on a night when the moon is not visible?

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5th Grade - March 12, 2004

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Team Multiple Choice Contest

Location	Distance (yards)		Method of Travel	Average Speed (yards per second)
School	560		Walking	1
Grocery Store	400		Running	3
The Gym	750		Unicycling	6
Friend's House	300		Bicycling	7
Movie Theater	510		Motor Scooter	10
Candy Shop	840		Car	20

To organize his daily travel, Max Powers records the locations he frequently visits followed by the distances of these locations from his house. Then, Max records the data for the ways he could to travel to these locations.

Note: 1 yard = 3 feet, 1 mile = 5280 feet

Questions

1	Which location is farthest from Max's house? A. Candy Shop B. Movie Theater C. School D. Grocery Store E. The Gym
2	How many times faster is it for Max to use his car than for him to walk? A. 19 B. 20 C. 21 D. 22 E. Answer not given
3	How far in yards would Max travel if he wanted to go to a movie, return home, then go grocery shopping, and return home once more? A. 910 B. 1310 C. 1420 D. 1820 E. Answer not given
4	What would be the average speed of walking in feet per hour? A. 1080 B. 1200 C. 10800 D. 15840 E. Answer not given
5	Max is at his house and needs to take 50 pounds of weights to the gym. If he travels to the gym using a unicycle and he can only carry a maximum of 15 pounds while using this method of travel, what is the minimum time in seconds required to transport the weights to the gym? A. 625 B. 750 C. 875 D. 1000 E. Answer not given
6	One day, Max decides to have a party. Before the party, he leaves to buy food at the grocery store on a unicycle. Lenny doesn't realize the party is later and leaves the grocery store on a motor scooter to travel to Max's house at the same time Max leaves his house. If they take the same road, at what distance in yards from Max's house do they meet? A. 50 B. 150 C. 250 D. 350 E. Answer not given
7	Find Max's average speed in yards per second if he runs to the gym from his house and then returns home on a unicycle. Average speed is defined as total distance divided by total time. A. 4 B. 4.5 C. 5 D. 9 E. Answer not given
8	Moe, Barney, and Max want to race to the movie theater starting from Max's house. Moe begins first by running to the movie theater. After eighty seconds, Barney begins unicycling towards the movie theater. Thirty five seconds after Barney starts, Max takes off towards the movie theater using a motor scooter. What is the order of the finishers from first to last? A. Moe, Barney, Max B. Max, Barney, Moe C. Max, Moe, Barney D. Barney, Moe, Max E. Answer not given

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For three days, Max decides that he wants to randomly select his method of travel taking him to work. What is the probability that exactly one of the three days, Max walks to work?
A. $\frac{25}{72}$ B. $\frac{25}{36}$ C. $\frac{1}{6}$ D. $\frac{1}{2}$ E. Answer not given

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5th Grade - March 12, 2004

Team Contest



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1	Daniel has 40 meters of fence. He takes one half of the fence and builds a square pasture. He then takes one half of the remaining fence to build a circular pasture and uses the last of the fence to build a rectangular pasture with the long side $\frac{3}{2}$ times the length of the short side. What is the total area of the three pastures, in meters squared?
2	Vimal plays with sock puppets. How many ways can he arrange five distinct sock puppets on his two hands?
3	Libbey is 100% beautiful at the beginning of each day after her beauty rest. Each time she encounters someone grumpy, she gives away 10% of however much beauty she has left in attempt to better the grump's day. If she meets three grumps in one day, what percent beautiful is she at the end of the day?
4	Kai decides to join the circus, but first he must learn how to be a clown, how to stick his head in a tiger's mouth, how to swing on a trapeze, how to swallow flames, and how to juggle swords. Each activity takes him twice as long to learn as the previous one. If it takes him one day to learn how to be a clown, in how many days will he be ready to join the circus?
5	Find the sum of the following sequence: -7, -5, -3, ...9, 11, 13
6	Teddy writes tests very efficiently. He can write ten questions in 23 minutes. Luke can only write one good question in 23 minutes. If they both write questions at a steady rate for an hour, how many questions do they finish total in an hour?
7	In order to be alive, awake, alert, enthusiastic on any given day, Keisha must take a cold shower and drink a cup of coffee. If the probability that she takes a cold shower is $\frac{4}{5}$ and the probability that she drinks coffee is $\frac{1}{2}$ on any given day, what is the probability she is alive, awake, alert, enthusiastic today?
8	Berde the roof builder needs 200 roof tiles for a small house, 300 roof tiles for a medium house, 500 roof tiles for a large house. How many roof tiles will he need for 5 small, 3 medium, and 2 large houses?
9	The ratio of post players to guard players on the Gonzaga basketball team is 3:2. If there are 15 players on the team, how many posts would be left over if each guard paired up with a post?
10	Caveman Sampson chases a sabertooth turkey at an average speed of 3 miles per hour. The turkey runs at an average speed of 5 miles per hour, but rests for 2 hours after running for 2 hours. How long, in hours, will it take Sampson to catch the turkey if the turkey starts 2 miles in front of him and they start running at the same time?

Person #1 Practice Relay	What is 7×3	21
Person #2 Practice Relay	TNYWG + 8	29
Person #3 Practice Relay	TNYWG + TNYWG	58
Person #4 Practice Relay	TNYWG \times 3	174
		
Person #1 Relay #1	The number of inches in a foot times 5	60
Person #2 Relay #1	TNYWG \times 7	420
Person #3 Relay #1	TNYWG \div (5^2 + the third smallest positive prime number)	14
Person #4 Relay #1	TNYWG squared	196
		
Person #1 Relay #2	Jeff eats 7 cookies in 11 seconds. How many cookies could Jeff eat in two minutes and 1 second?	77[cookies]
Person #2 Relay #2	TNYWG - 7×7	28
Person #3 Relay #2	How many apples do you have if you have 4^2 + TNYWG - 4 apples?	40 [apples]
Person #4 Relay #2	TNYWG + the number of nickels in one dollar and 35 cents?	67

Practice Relay

Person#1

What is 7×3

Practice Relay

Person#1

What is 7×3

Practice Relay

Person#1

What is 7×3

Practice Relay

Person#1

What is 7×3

Practice Relay

Person#2

TNYWG + 8

Practice Relay

Person#2

TNYWG + 8

Practice Relay

Person#2

TNYWG + 8

Practice Relay

Person#2

TNYWG + 8

Practice Relay

Person#3

TNYWG + TNYWG

Practice Relay

Person#3

TNYWG + TNYWG

Practice Relay

Person#3

TNYWG + TNYWG

Practice Relay

Person#3

TNYWG + TNYWG

Practice Relay

Person#4

TNYWG × 3

Practice Relay

Person#4

TNYWG × 3

Practice Relay

Person#4

TNYWG × 3

Practice Relay

Person#4

TNYWG × 3

Relay #1

Person#1

The number of inches in a foot times 5

Relay #1

Person#1

The number of inches in a foot times 5

Relay #1

Person#1

The number of inches in a foot times 5

Relay #1

Person#1

The number of inches in a foot times 5

Relay #1
Person#2
TNYWG × 7

Relay #1
Person#2
TNYWG × 7

Relay #1
Person#2
TNYWG × 7

Relay #1
Person#2
TNYWG × 7

Relay #1

Person#3

TNYWG \div ($5^2 +$ the third smallest positive prime number)

Relay #1

Person#3

.TNYWG \div ($5^2 +$ the third smallest positive prime number)

Relay #1

Person#3

TNYWG \div ($5^2 +$ the third smallest positive prime number)

Relay #1

Person#3

TNYWG \div ($5^2 +$ the third smallest positive prime number)

Relay #1
Person#4
TNYWG squared

Relay #1
Person#4
TNYWG squared

Relay #1
Person#4
TNYWG squared

Relay #1
Person#4
TNYWG squared

Relay #2

Person#1

Jeff eats 7 cookies in 11 seconds. How many cookies could Jeff eat in two minutes and 1 second?

Relay #2

Person#1

Jeff eats 7 cookies in 11 seconds. How many cookies could Jeff eat in two minutes and 1 second?

Relay #2

Person#1

Jeff eats 7 cookies in 11 seconds. How many cookies could Jeff eat in two minutes and 1 second?

Relay #2

Person#1

Jeff eats 7 cookies in 11 seconds. How many cookies could Jeff eat in two minutes and 1 second?

Relay #2
Person#2
TNYWG - 7 × 7

Relay #2
Person#2
TNYWG - 7 × 7

Relay #2
Person#2
TNYWG - 7 × 7

Relay #2
Person#2
TNYWG - 7 × 7

Relay #2

Person#3

How many apples do you have if you have $4^2 + \text{TNYWG} - 4$ apples?

Relay #2

Person#3

How many apples do you have if you have $4^2 + \text{TNYWG} - 4$ apples?

Relay #2

Person#3

How many apples do you have if you have $4^2 + \text{TNYWG} - 4$ apples?

Relay #2

Person#3

How many apples do you have if you have $4^2 + \text{TNYWG} - 4$ apples?

Relay #2

Person#4

TNYWG + the number of nickels in one dollar and 35 cents?

Relay #2

Person#4

TNYWG + the number of nickels in one dollar and 35 cents?

Relay #2

Person#4

TNYWG + the number of nickels in one dollar and 35 cents?

Relay #2

Person#4

TNYWG + the number of nickels in one dollar and 35 cents?

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Mental Math Contest

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

Person #1		
1	What is the area, in square inches, of a rectangle with height 3 inches and base 6 inches?	18 [square inches]
2	If Kei sha types 40 words per minute, how many minutes would it take her to type an 800 word essay?	20 [minutes]
3	Paul is thinking of a number. If he subtracts 4 from this number, he gets 5. Which number is he thinking of?	9
4	What is the product of 5 and 12.	60
Person #2		
1	Shelby spends \$2.50 on lunch every day. How much lunch money, in dollars, does she need for a regular 5 day school week?	(\$) 12.50
2	What is the area of a right triangle with leg lengths of 4 and 9?	18
3	How much time, in minutes, passes between the time when Michelle arrives at school at 7:00 AM and when school starts at 8:25 AM?	85 [minutes]
4	If half my number is 40, what is twice my number?	160
Person #3		
1	If 100 days after the day before yesterday will be Tuesday, what day is today?	Tuesday
2	Find two times twice two, then double it.	16
3	What is the product of half of ten times half of zero?	0
4	What is the units digit of the product of 849 and 762?	8
Person #4		
1	If my number is two less than six squared, what is twice my number?	68
2	Name the largest counting number less than the sum of 19 and 17.	35
3	How much money, in dollars, would I have if I had 13 quarters?	\$3.25
4	How many hours is it from an hour before noon until an hour after midnight?	14[hours]

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<u>College Knowledge Bowl Questions #1</u>		
1	Sampson teaches five classes daily. Three of his classes are full with 30 students while his other two classes only have 18 students. How many students does Sampson teach in one day?	126[students]
2	What is the product of all the integers from -10 to 10?	0
3	Gary Walther is thinking of a number he calls a "bearcat". A number is a "bearcat" when it has a remainder of 1 when divided by 5 and when it is also a perfect square. What is the second "bearcat" number greater than one?	36
4	Lee has to organize 304 individual tests into stacks of 16 and 76 team tests into stacks of 4. How many stacks of tests does he have when he is finished?	38[stacks]
5	There are spiders and cats in an arena. If there are 20 heads and 120 legs, how many spiders are there?	10 [spiders]
6	How many prime numbers are between 20 and 30?	2[primes]
7	Lee brings Libbey a magazine every 2 days. Libbey can read a magazine in 3 days. After 30 days, how many magazines has Libbey not read yet?	5[magazines]
Number <u>8</u> is an extra question. Only use it if needed.		
8	What is 598 times 322?	192,556

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<u>College Knowledge Bowl Questions #2</u>		
1	What is the sum of the first 5 perfect squares?	55
2	Find the number halfway between 8 and 18 on a number line.	13
3	Rebecca has ten identical coins worth \$0.50 altogether. If she keeps half these coins and trades each of the other coins for a coin worth twice as much, how many cents will she have?	75[¢]
4	Find the sum of 182 and 43, then divide by 5.	45
5	A certain rectangle has the same area as a square of side length 6. The length of the rectangle is 12. What is its width?	3
6	Find the largest natural number that when added to 351 results in a sum less than 500.	148
7	Find the number of units in the perimeter of a dodecagon with a side length of 2 units.	24[units]
Number <u>8</u> is an extra question. Only use it if needed.		
8	Riggs sits in seat #43 at a theater with consecutively numbered seats. Kyl sits in seat #61 of the same row. How many seats are between them?	17[seats]

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<u>College Knowledge Bowl Questions #3</u>		
1	If $\frac{1}{3}$ of the cookies in my box are chocolate chip and the rest are oatmeal, what is the ratio of chocolate chip to oatmeal cookies in my box?	$\frac{1}{2}$ or 1 to 2 or 1:2
2	Julie will turn 37 years old in the year 2012. In what year was she born?	1975
3	If I had baked eight more cookies, I could put four cookies on each of 23 plates. How many dozen cookies did I bake?	7[dozen]
4	Cody has four scarves, three pairs of pants, and two t-shirts. If he wears one of each type of clothing at a time, how many outfits can he make?	24[outfits]
5	The time is 4:18 pm. Derek's drum lesson will start in 1 and $\frac{1}{5}$ hours and will last $\frac{1}{4}$ of an hour. What time is Derek's drum lesson over?	5:45 pm
6	How many positive multiples of 5 are less than 45?	8
7	Gregg has 42¢. What is the least number of coins he could have if none of his coins are nickels?	6[coins]
Number <u>8</u> is an extra question. Only use it if needed.		
8	What is the smallest perfect square number greater than 100?	121

"Math is Cool" Championships -- 2003-04

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Key

School Name _____ Team # _____

Proctor Name _____ Room # _____

Full Name: _____

Col 1 - Col 2

Individual Contest - Score Sheet

DO NOT WRITE IN SHADED REGIONS

Each out of 20

	Answer	1 or 0	1 or 0
1	3		
2	125		
3	4		
4	1		
5	50 [%]		
6	60 [feet]		
7	2		
8	>		
9	29.168		
10	14		
11	54		
12	120 [more shakes]		
13	[\$] 10.44		
14	27		
15	1/5		
16	267,338		
17	9' 2		
18	15		
19	5 [zeros]		
20	4 [units]		
Column Final:			

	Answer	1 or 0	1 or 0
21	39		
22	7/5 or 7:5 or 7 to 5		
23	-41		
24	Friday		
25	-9 [EC]		
26	3		
27	-17		
28	10		
29	85		
30	1000		
31	18 [arrangements]		
32	29 [units]		
33	90 [E]		
34	60 [stores]		
35	31		
36	72 [inches squared]		
37	76 [minutes]		
38	320		
39	6		
40	14/841		
Column Final:			

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Key

School Name _____ Team # _____

Proctor Name _____ Room # _____

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

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School Name _____ Team # _____

Proctor Name _____ Room # _____



1st Score

Out of 10

Team Contest-Score Sheet

DO NOT WRITE IN SHADED REGIONS

	Answer	1 or 0	1 or 0
1	31 + 25/π [meters squared]		
2	20 [ways]		
3	72.9[%]		
4	31 [days]		
5	33		
6	28 [questions]		
7	2/5		
8	2,900 [Roof tiles]		
9	3 [posts]		
10	4 [hours]		

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School Name _____ Team # _____

Proctor Name _____ Room # _____



"Math is Cool" Championships -- 2003-04

5th grade - March 12, 2004

Key

School Name _____ Team # _____

Proctor Name _____ Room # _____

Relay Contest - Score Sheet

Practice relay
21
29
58
174
Answer for relay #1
60
420
14
196
Answer for relay #2
77 [cookies]
28
40 [apples]
67