"Math Is Cool" Championships -- 1997-8

Sponsored by: D. Stoffel, F. Goldstein, &S. Pachernegg

March 20, 1998

Individual Contest, Grade 5

Express all answers as reduced fractions unless stated otherwise.
Leave answers in terms of π.
Do not round any answers unless stated otherwise.

1. Find the remainder when 9873 is divided by 3.

2. Reduce : $\frac{78}{132}$

3. Express $\frac{3}{16}$ as a decimal.

4. Evaluate: 236x102

5. Evaluate: 12345-7899

6. Evaluate: 1298001+128999

7. Evaluate: 2.341x 1.23

8. What is the first prime number greater than 50?

9. Jina has a drawer that contains 9 red socks, 11 purple socks, 15 blue socks, 25 yellow socks, 8 green socks, and 4 white socks. In a dark room, how many individual socks must be taken from the drawer to be sure she has a matching pair?

10. Lisa received scores of 99, 98, 100 , 100 and 99 on her first five math tests. If there is only one test left, what is the **lowest** grade she could receive on that test and still have an average of 90?

11. After winning first place in the "Math Is Cool" Championships, Jenny, the captain of her math team, insisted that everyone shake hands exactly once with everyone else on the math team. Assuming it was a four member math team, how many hand shakes took place?

12. Morten wants to help stop erosion, so he decides to pack boulders to the top of mountains. While packing a boulder to the top of Mt. Rainier, which is approximately 25,000 feet to the top, he notices that the boulder slides down the hill 100 feet every night while he sleeps. If Morten packs the boulder up the hill 4,200 feet everyday, on which day will he reach the top with the boulder? (Assume that he starts at sea level)

13. Katie counts by sevens and Jean counts by elevens. What is the first number after zero that both Katie and Jean will say?

14. Katie makes 7 out of every 9 shots she tries when she plays basketball. Out of 81 shots Katie tries, how many will she make?

15. The smallest odd number greater than 479 is divided by 11. What is the remainder of this division?

16. What is the time 6 hours and 29 minutes before 5:33 A.M.?

17. A tree has 2 branches when it is 1 year old and it doubles the number of branches it has each year thereafter. How many branches will the tree have when it is 7 years old?

18. On a Math Team canoe trip, seven members can eat 15 sandwiches every day. If the canoe trip lasts three days, and there are 21 members on the trip, how many sandwiches will be eaten during the trip?

19. What is the largest prime factor of 45?

20. What is the sum of the interior angles of a triangle?

21. The sum of 3 positive whole numbers is 30. What is largest possible value of one of these numbers?

22. There are twice as many girls on the math team as boys. If there is a total of 45 members, how many girls are on the math team?

23. Robert's dog, Random Dog, weighs 13 pounds, is 3 feet tall, and is 45 inches long. Jungle Cat weighs 5 pounds and 15 inches long. How much longer, in inches, is Random Dog than Jungle Cat?

24. Two positive numbers differ by one. One number has one digit while the other number has two digits. What is the sum of the numbers?

25. Evaluate: 1+2+3+.....+12+13+14

26. From a standard deck of 52 cards, what is the probability of drawing a red king in one draw?

27. With the single roll of two six sided dice, what is the probability that their sum is 7?

28. Farmer Hilliard noticed that there were 124 feet in his herd of cows. How many cows were in his herd?

29. What is the average of 2,4,6,8 and 10?

30. Dan's chickens lay 11 eggs a day. How many days will he need to wait in order to have 20 dozen eggs ready for market?

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Team Multiple Choice Contest, Grade 5

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1. Amanda, David, Caleb and Grace were playing a dice game. They needed to know all the possible products they could get by rolling two six-sided die. How many different products are possible?

A) 36 B) 18 C) 9 D) answer not given

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2. When David puts his marbles in groups of five, he has one marble left over. When he puts his marbles in groups of six, he has one marble left over. He has less than forty marbles and more than one marble. How many marbles does he have?

A) 11 B) 23 C) 31 D) answer not given

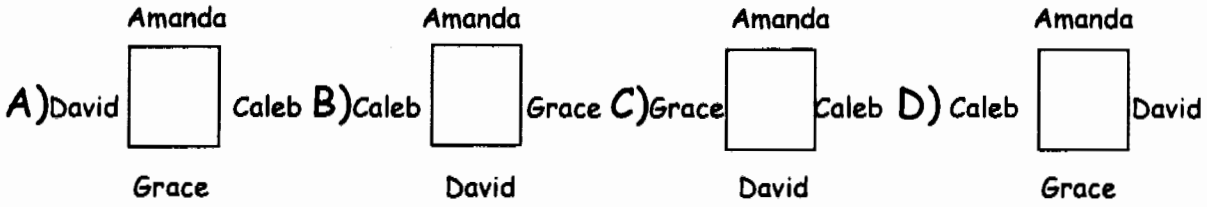
3.
$$\begin{array}{r} AAA \\ BBB \\ +\,CCC \\ \hline DDD \end{array}$$

A, B, C, and D each stand for a different whole number. Which of these is a possibility for DDD?

A) 333 B) 444 C) 555 D) 777

4. Amanda, David, Grace, and Caleb are seated around a table. Their jobs are a teacher, a banker, a carpenter, and an artist. Use these clues to decide which seating arrangement below is the correct one. (Amanda and Grace are women and David and Caleb are men.)

   1. The artist sat on Grace's left.
   2. The banker sat across from David.
   3. Amanda and Caleb sat next to each other.
   4. A woman sat on the carpenter's left.



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5. Chef Sampson decided to have hamburger helper for supper. He bought 2 $\frac{1}{2}$ pounds of hamburger which cost $1.50 per pound. How much did the meat cost?

A) $3.00 B) $3.25 C) $4.00 D) answer not given

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6. A ream of paper contains 500 sheets. Paper comes ten reams to a box. Washington Elementary ordered 418 boxes. How many reams of paper did the school order?

A) 209 B) 2090 C) 20900 D) 209000 E) answer not given

7. How much is one small coke? Use the clues:
   1. The cost is between 20¢ and 30¢.
   2. You can buy one coke with exactly 6 coins.
   3. You can buy two cokes with exactly 6 coins.
   4. You can buy three cokes with exactly 6 coins.
   5. You can use pennies, nickels, dimes or quarters.

A) 24¢ B) 54¢ C) 23¢ D) answer not given

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8. Amanda, at a gymnastics meet, needs an all-around score of at least 30.0 to qualify for sectionals. An all-around score is determined by the sum of the scores on the four events (floor, vault, beam, bars). Amanda has these scores so far:

   Beam = 8.4
   Vault = 6.2
   Bars = 7.1

   What is the lowest score she would need on the floor event to qualify for sectionals?

A) 9.0 B) 8.7 C) 9.3 D) Answer not given

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9. Tammy made 2-inch wide sweat bands for the 12 members of the girl's basketball team. Each band used $\frac{1}{6}$ of a yard of terrycloth. (Each member uses two sweat bands.) How much material was needed in all?

A) $\frac{1}{3}$ yards B) 2 yards C) 4 yards D) answer not given

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March 20, 1998

Team Contest, Grade 5

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1. Your team of four averaged 21 points on the individual test today. Two of the scores of your team members were 27 and 28. If the third and fourth members scores differ by 3, what were their two scores?

2. Find the value of *x*: $\sqrt{9+16+144} = \sqrt{9} + \sqrt{16} + \sqrt{x}$

3. To the nearest cent, what is the cost of a $29.99 calculator in a state with a 7% sales tax? (Answer must be $ form)

4. Evaluate: $\dfrac{\frac{1}{2} \div \frac{3}{4}}{\frac{5}{6} \div \frac{7}{8}}$

5. Silas has his piggy bank jam-packed full with 7820 quarters. In terms of dollars how much money does he have in his bank?

6. Solve for *Drew* if, $\dfrac{Drew + 8}{Drew - 4} = 7$.

7. Find the product of all numbers.

8. Evaluate: 7^3

9. Find the next term in the sequence: 5,11,17,23,_____

10. Out of 57 students at the Math Is Cool Academy for 5th Graders, 16 are taking Algebra, 34 are taking Geometry, and 7 are taking both. How many students are taking neither Algebra nor Geometry?

Practice relay
Person#1
8 + 14

Practice relay
Person#2
TNYWG÷2

Practice relay
Person#3
TNYWG **times** 4

Practice relay
Person#4
TNYWG÷11

Relay #1
Person#1
What is the product of 72 and 4?

Relay#1
Person#2
TNYWG÷9

Relay#1
Person#3
What is the product of TNYWG and TNYWG?

Relay#1
Person#4
What is TNYWG÷64?

Relay#2
Person#1
What is the sum of the interior angles of a triangle?

Relay#2
Person#2
What is the lowest common multiple of 45 and TNYWG?

Relay#2
Person#3
Find the sum of the first TNYWG÷36 positive whole numbers?

Relay#2
Person#4
Find the sum of the reduced numerator and denominator of $\frac{TNYWG}{30}$

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5th Grade - March 20, 1998

Mental Math

Express all answers as reduced fractions, where applicable, unless otherwise instructed.

Person #1

1. What is 9 times 8?
2. What is the sum of the first five prime numbers?
3. How many sides does a pentagon have?
4. How many odd numbers are between forty and fifty?

Person #2

1. What is 8 x 12?
2. How many sides does an octagon have?
3. Math practice started at 2:45 p.m. Michelle arrived 16 minutes early. What time did she arrive?
4. What is the perimeter of an equilateral triangle with a side of length 9?

Person#3

1. What is 9 x 6?
2. What is one-third of 42? (Answer must be a whole number.)
3. If I made five dozen cookies last night, how many cookies did I make?
4. How many minutes elapse between 11:50 a.m and 1:25 p.m?

Person#4

1. What is 8 x 7?
2. The sum of your parents' ages is 65. What will the sum of their ages be in five years?
3. What is the smallest prime number greater than 30?
4. How many pints are in two gallons?

"Math Is Cool" Championships -- 1997-8
5th Grade -March 20, 1998
College Knowledge Bowl Questions #1

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1. How many dimes are worth 98 quarters?

Answer: 245

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2. In a zoo, there are 18 four legged animals, 15 two legged animals and seven animals with no legs. How many legs are in the zoo?

Answer: 102

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3. What is the name of the geometric shape that has twice as many sides as a triangle?

Answer: Hexagon

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4. What is the sum of the reduced numerator and denominator of 18/81?

Answer: 11

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5. What is 14 times 14?

Answer: 196

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6. If 19 bags can hold 171 marbles, how many marbles can 2 bags hold?

Answer: 18

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7. What is the probability of getting 2 heads when 2 coins are flipped?

Answer: 1/4

Extra Question:

What is the sum of the interior angles of a triangle?

Answer: 180

"Math Is Cool" Championships -- 1997-8
5th Grade -March 20, 1998
College Knowledge Bowl Questions #2

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1. How many sides does a rhombus have?

Answer: 4

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2. If today is Friday, what day of the week was it 99 days ago?

Answer: Thursday

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3. If three dice are rolled, how many different sums are possible?

Answer: 16

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4. If 19 odd numbers are added to 98 even numbers, is the sum always odd, even, or cannot be determined?

Answer: odd

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5. What is the product of the next three numbers in the series 20, 15, 10?

Answer: 0

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6. What is 9999 divided by 99?

Answer: 101

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7. Math class went from 10:59 a.m. to 12:05 p.m. How many minutes long was math class?

Answer: 66

Extra Question:

If two angles are supplementary, what is their sum?

Answer: 180

"Math Is Cool" Championships -- 1997-8

5th Grade -March 20, 1998

College Knowledge Bowl Questions #3

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1. What is one 9 plus nine 8's?

Answer: 81

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2. How many feet are in 138 inches? Express your answer as a mixed number in simplest form.

Answer: 11 $\frac{1}{2}$ feet

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3. In the fun run, "Einstein's Miles," each participant drinks an average of two cups of water. If there are 200 participants, how many gallons of water are consumed?

Answer: 25

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4. Silas is taking 8 classes. If A's are worth 4 grade points and B's are worth 3 grade points, what is the lowest number of A's he could get and still have a grade-point average of at least 3.5?

Answer: 4

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5. What is the tens digit of the product of 555 and 220?

Answer: 0

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6. What is the remainder when 98 is divided by 19?

Answer: 3

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7. How many prime numbers are less than 15?

Answer: 6

Extra Question:

What is the sum of 1 + 2 + 3 + . . . +10?

Answer: 55

Math Is Cool" Championships -- 1997-8

Individual Contest - Score Sheet

5th Grade - March 20, 1998

Score:

Key 5th

School:_____

Full Name:_____

DO NOT WRITE IN SHADED REGIONS

	Answer		
1.	0		
2.	13/22		
3.	.1875		
4.	24072		
5.	4446		
6.	1,427,000		
7.	2.87943		
8.	53		
9.	7 or 7 socks		
10.	44		
11.	6 or 6 handshakes		
12.	7 or 7th day		
13.	77		
14.	63		
15.	8		

	Answer		
16.	11:04p.m.		
17.	128 or 128 branches		
18.	135 or 135 sandwiches		
19.	5		
20.	180		
21.	28		
22.	30 or 30 girls		
23	30 or 30 inches		
24.	19		
25.	105		
26.	1/26		
27.	1/6		
28.	31 or 31 cows		
29.	6		
30.	22 or 22 days		

"Math Is Cool" Championships - 1997-8

Individual Multiple Choice Contest - Score Sheet

5th Grade - March 20, 1998

Score:

Key 5th

School:_____ Team #:_____

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

"Math Is Cool" Championships - 1997-8

Team Contest - Score Sheet

5th Grade - March 20, 1998

Score:

Key 5th

School:_____ Team #:_____

DO NOT WRITE IN SHADED REGIONS

	Answer		
1.	13, 16		
2.	36		
3.	$32.09		
4.	7/10		
5.	1955 or $1955		
6	6		
7.	0		
8.	343		
9.	29		
10.	14 or 14 students		

"Math Is Cool" Championships -- 1997-8

Mental Math - Score Sheet

5th Grade - March 20, 1998

Score:

Key 5th

School:_____ Team #:_____

A. 1. 72

2. 28

3. 5

4. 5

B. 1. 96

2. 8

3. 2:29 p.m.

4. 27

C. 1. 54

2. 14

3. 60

4. 95

D. 1. 56

2. 75

3. 31

4. 16

"Math Is Cool" Championships - 1997-8

Relay -- Score Sheet

5th Grade - March 20, 1998

Practice relay

4

Answer for relay #1

16

Answer for relay #2

3