"Math is Cool" Masters-1999-00

Sponsored by: ZAK DESIGNS - SPOKANE, WA

6th Grade -April 29, 2000

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 green cover sheet.

1. Evaluate; 2,390 + 1,781

2. Evaluate 32,143-8,998

3. Find the product of 17 and 23

4. What is the remainder of 234,567 ÷ 3

5. True or False 1 + 20 + 3 + 40 = 10 + 2 + 30 + 4

6. If my chicken laid 6 eggs a week, how many weeks would it take for my chicken to lay 14 dozen eggs?

7. Evaluate: 12.345 - 2.34

8. My family reads 12 math books a day, how many math books will we read in a week?

9. What is the sum of the factors of 6?

10. How many inches are in one yard?

11. How many seconds are in two hours?

12. Find the missing number: 2 + 3 + 4 + 5 + 6 + ___ = 10 + 11 + 12 + 13

13. How many cups are in a gallon?

14. Is the product of all numbers positive, negative, or neither?

15. Dillon and Sarah hiked 5 miles in one hour and fifteen minutes. At what rate, in miles per hour, were they traveling?

16. What is the least number of sides a polygon can have?

17. Silas was 22 inches tall at the end of his freshman year. Over the summer he ate all of his vegetables and started his sophomore year five times taller than when he ended his freshman year. How many inches did he grow over the summer?

18. Yes or No: Is a circle a polygon?

19. What is the probability of rolling a sum of six when you roll two six sided dice?

20. The distance from Ayton to Beevil is 84 miles. The distance from Beevil to Ceeburg is 68 miles. What is the greatest possible distance, in miles, from Ayton to Ceeburg?

21. One of the Agents of Mathness can lift one refrigerator. Combined, two Agents can lift 4 refrigerators. Combined, three Agents can lift 9 refrigerators. Combined, how many refrigerators can four Agents lift?

22. If 16 tripsoids weigh 1 ton, how many pounds does 1 tripsoid weigh?

23. The product of 11 positive integers is 20. What is the smallest possible sum of these 11 integers?

24. What time is it 1000 minutes before 3:15 p.m.?

25. Two sides of a parallelogram are 16 inches and 12 inches. What is the sum of the other two sides, in inches?

26. How many ways can you rearrange the letters in "ALGEBRA"?

27. What is the 200^{th} digit in the number .123451234512345...

28. A password is created by randomly selecting 3 digits to form a 3-digit number. How many passwords are possible?

29. The ratio of the perimeters of two similar polygons is 2:3. What is the ratio of their areas?

30. A boy ran up a hill at $1\frac{1}{2}$ mph and came down the hill at $4\frac{1}{2}$ mph. The trip took him 6 hours. How many miles is it to the top of the hill?

31. A ream has 2000 sheets of paper. A box has 9 reams. How many 200 page books can be printed with one box?

32. The faces of a 3x3x3 cube are painted, and then the cube is split into 27 unit cubes. How many unit cubes have 3 faces painted?

33. As Sarah continues preparing for her backpack trip she found that lard has 120 calories/13 grams. She wants to know how many calories are in each ounce of lard. Use the following information she found on the package to help her out. Each package is one pound. Each package has 35 servings. Each serving is 13 grams. (Express your answer as a decimal.)

34. What is the volume of a pyramid with base area of 18 and height of 27?

35. What is the distance from the point (33,17) to the point (33,-51)?

36. 500 cars in a lot are cataloged using a letter followed by a single digit. How many cars will have the same catalog code as another car?

37. Convert $.\overline{3}$ to a fraction in reduced form.

38. What is the area of the triangle with vertices at points (0,0), (5,0) and (2,4)?

39. A hubcap with radius 24 inches falls off the Math Team's Land Rover and rolls down the street. How many times will it rotate if the street is 200 pi feet long?

40. An equilateral triangle is split into 4 congruent equilateral triangles. Each of those is then split into 4 congruent equilateral triangles. What is the ratio of the area of the original triangle to one of the smallest triangles?

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Multiple Choice Contest

1. If a>b>0 then

   a) $\frac{1}{a}=\frac{1}{b}$ b) $\frac{1}{b}>\frac{1}{a}$ c) $\frac{1}{b}<\frac{1}{a}$ d) $\frac{1}{b}<0$ e) $\frac{1}{a}<0$

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2. For every three bananas Joel eats, Steve eats 2 apples. If Steve eats 372 apples in 24 hours, how many bananas does Joel eat?
   A)301 B)558 C) 559 D) 702 E) Answer not given

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3. A grocery store lowered the price of bananas from 45¢ to 30¢. For $7, how many more bananas could you buy now than before?
   A)8 B)15 C)230 D)46 E) Answer not given

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4. How many different 3-digit whole numbers are there if every digit is odd?
   A)1 B) 27 C) 64 D) 125 E) Answer not given

---

5. Silas multiplied three of his favorite prime numbers together. How many factors does this number have?
   A) 8 B) 7 C) 6 D) 5 E) Answer not given

---

6. How many 3-digit numbers are divisible by 12 and not by 20?
   A) 14 B) 61 C) 75 D) 89 E) Answer not given

---

7. In the words "Math is Cool", what is the ratio of vowels to letters?
   A)2:5 B) 2:3 C)5:2 D)3:2 E) Answer not given

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8. If 2 dogs weigh as much as 15 chickens and 2 chickens weigh as much as 1 cat, how many cats weigh as much as 4 dogs?
   A)15 B) 7 C) 22 D) 44 E) Answer not given

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9. How many edges does a cube have?
   A) 6 B) 8 C) 10 D) 12 E) Answer not given

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6th Grade -April 29, 2000

Team Contest

Express all answers as reduced fractions in terms of radicals.
Leave answers in terms of π where applicable.
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1. Farmer Sampson is making a four-sided pen for his goat, using 80 yards of fence. What is the largest possible area of his pen?

2. What is the largest square number less than 400?

3. What is the probability that if a page is selected out of a 350 page textbook, it will be greater than 84 and less than 155?

4. For every three bananas Joel eats, Steve eats two apples. If Steve eats 372 apples in 24 hours, how many bananas does Joel eat?

5. The sum of three consecutive integers is 48. What is their mean?

6. My favorite number is 4 times bigger than my second favorite number. My second favorite number is 12 less than my favorite number. What is my favorite number?

7. The sum of 18 numbers is 3. When one is removed, the sum is -1/2. What is the value of the number that was removed?

8. The total area of four congruent circles is 144π. What is the circumference of one circle?

9. How many 4 digit numbers can be created by placing two two-digit square numbers next to each other?

10. What is the largest whole number value, in degrees, that an angle can have in a right triangle, other than the 90E angle?

6Relay #1
Person#1
What is the units digit of the product of 234 and 17 ?

6Relay#1
Person#2
What is the difference between the number of inches in two feet and TNYWG?

6Relay#1
Person#3
Divide the TNYWG by the number of ounces in a half pound.

6Relay#1
Person#4
What is the sum of the number of feet on TNYWG sheep and the number of feet in two yards?

6Relay#2
Person#1
What is the sum of 6,129 and 2,431?

6Relay#2
Person#2
What is the remainder of TNYWG divide by 11?

6Relay#2
Person#3
What is the area of a rectangle with length TNYWG and height 8?

6Relay#2
Person#4
How many seconds are in TNYWG minutes?

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6th Grade -April 29, 2000

Mental Math Contest

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

Person #1

1. What is the product of 22 and 7?
2. What is the perimeter of a square with a side of length 9?
3. How many sides does a hexagon have?
4. How many feet are in a mile?

Person #2

1. What is the quotient of 54 and 9?
2. A house is 96 inches tall. How tall is the house in feet?
3. How many cups are in 3 gallon?
4. You drove 30 miles from your house to Grandma's house. You then drove 20 miles to your Uncle's house. What is the shortest possible distance back to your house?

Person#3

1. What is the area of a circle with diameter 14?
2. Your flight is scheduled to leave Spokane to "Math is Cool" town at 1:00 p.m.. The airline requests that you come to the airport an hour before the flight is scheduled to leave. You arrived at the airport 12 minutes before the airline requested that you arrive. What time did you get to the airport?
3. What is one-fifth of 45?
4. Two different whole numbers are less than 10. What is the largest possible sum of these two numbers?

Person#4

1. What is the difference between 421 and 199?
2. How many pounds does a 64 ounce math book weigh?
3. What is the area of a triangle with base of length 12 and height 7?
4. What is 20 percent of 35?

"Math is Cool" Masters-1999-00

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and ZAK DESIGNS - SPOKANE, WA

5^{th} & 6^{th} Grade - April 29, 2000

College Knowledge Bowl Questions #1		
1	What is the smallest 3-digit prime number?	101
2	What is the sum of the reduced numerator and denominator of $\frac{500}{350}$?	17
3	When I divide a certain number by 8, the quotient is 13 and the remainder is 2. What is the number?	106
4	How many diagonals can be drawn in a convex pentagon?	5
5	What is the average of four 8's?	8
6	Beth read page 100 and 200 and all the pages in between. How many pages did she read?	101
7	What is the number of days in August minus the number of days in April?	1
Number ***8*** is an extra question. Only use it if needed.		
8	Dillon bought a special rock that cost $3.20. The rock weighed one pound. How much, in cents, per ounce did he pay for the rock?	20(¢)

"Math is Cool" Masters-1999-00

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and ZAK DESIGNS - SPOKANE, WA

5^{th} & 6^{th} Grade - April 29, 2000

College Knowledge Bowl Questions #2		
1	Evan and Sarah have been best friends for 5 and one-half years. How many months have they been best friends?	66(months)
2	In what month does the 160^{th} day of the year occur?	June
3	Krista always gets 5 out of every 8 questions right on math competition tests. How many questions would she get correct if the test had 120 questions?	75(questions)
4	How many prime numbers are between 18 and 38?	5
5	How many 79¢ widgets can you buy with $5.00?	6
6	What is the sum of the first 7 positive odd numbers?	49
7	What is the sum of all the two digit prime numbers that begin with 3?	68
Number ***8*** is an extra question. Only use it if needed.		
8	Evaluate 5A +3B, when A=2 and B=3. Read as "Evaluate five times A plus 3 times B...."	19

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5^{th} & 6^{th} Grade - April 29, 2000

College Knowledge Bowl Questions #3		
1	If one can of paint covers 30 square feet, how many cans of paint do I need to cover 120 square feet?	4(cans)
2	If three scoops of powdered Gatorade mix is used to make one quart of drink, how many scoops of powdered Gatorade mix are needed to make one and a half gallons of drink?	18(scoops)
3	What geometric shape contains the most area for the least amount of perimeter?	Circle
4	If a frog chirps 20 times per minute, how many times will 4 frogs chirp in 3 minutes?	240
5	How many sets of parallel sides does a regular hexagon have?	3
6	Joe counted 132 paws in a field filled with dogs. How many dogs were in the field?	33
7	How many ounces are in 4 pounds?	64
Number ***8*** is an extra question. Only use it if needed.		
8	Find the square root of $3^2 + 4^2$.	5

"Math is Cool" Masters -- 1999-00

6th grade - April 29, 2000

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	4,171		
2	23,145		
3	391		
4	0		
5	F		
6	28(weeks)		
7	10.005		
8	84(books)		
9	12		
10	36(in)		
11	7200(sec)		
12	26		
13	16(cups)		
14	Neither		
15	4(mph)		
16	3		
17	88(in)		
18	No		
19	5/36		
20	152(miles)		

	Answer	1 or 0	1 or 0
21	16(refrig)		
22	125 (pounds)		
23	17		
24	10:35p.m.		
25	28 (inches)		
26	2520(ways)		
27	5		
28	1000 or 900(passwords)		
29	4:9 or 4/9		
30	4.5 or 4 $\frac{1}{2}$ miles		
31	180(books)		
32	8(cubes)		
33	262.5(cal)		
34	162(units$^{3)}$		
35	68		
36	480(cars)		
37	1/3		
38	10 (sq units)		
39	50(times)		
40	16:1 or 16/1		

"Math is Cool" Masters -- 1999-00

6th grade - April 29, 2000

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. Answers need to be recorded letters.

DO NOT WRITE IN SHADED REGIONS

Answer		-1, 0 or 2	-1, 0 or 2
1	B		
2	B		
3	A		
4	D		
5	A		
6	E ans 60		
7	A		
8	A		
9	D		

"Math is Cool" Masters -- 1999-00

6th grade - April 29, 2000

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	400 (square yards)		
2	361		
3	1/5		
4	558 (bananas)		
5	16		
6	16		
7	$3\frac{1}{2}$ or 7/2		
8	12π		
9	36		
10	89E		

"Math is Cool" Masters -- 1999-00

6th grade - April 29, 2000

School Name_____Team #_____

Proctor Name_____Room #_____

Key

Mental Math - Score Sheet

1	368
2	36
3	6
4	5280
1	6
2	8
3	48
4	10(miles)
1	54
2	11:48a.m.
3	9
4	17
1	222
2	4(lbs)
3	42
4	2

"Math is Cool" Masters -- 1999-00

6th grade - April 29, 2000

School Name_____Team #_____

Proctor Name_____Room #_____

Key

Relay Contest - Score Sheet

Answer for relay #1
14

Answer for relay #2
960