"Math is Cool" Masters-2000-01
Sponsored by: Lukins & Annis, P.S. and Wilbert Precast
5th & 6th Grade - May 12, 2001
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. Evaluate: 7,240,999 - 7,231,430

2. Evaluate: 325,783 + 1,812,789

3. Reduce : $\dfrac{28}{35}$

4. Express $\dfrac{2}{5}$ as a decimal.

5. Evaluate: 78 x 72

6. What is the first square number greater than 100?

7. Find the remainder when 9221 is divided by 3

8. What is the area of a right triangle with legs of 16 and 5?

9. What is the sum of the first five prime numbers?

10. How many diagonals can be drawn in a polygon with 10 sides?

11. What is the sum of the first ten even natural numbers?

12. How many ways can the letters in "DREW" be arranged?

13. A weather forecaster kept track of the temperature change over a six-hour period. The temperature at 5:00 am was -10.5 deg F. What was the temperature, in degrees Fahrenheit, at the end of the six-hour period?
    1st hour   rise   5.3 deg
    2nd hour   drop   2.1 deg
    3rd hour   drop   4.8 deg
    4th hour   rise   3.5 deg
    5th hour   rise 7.1 deg
    6th hour   drop   2.1 deg

14.   What is the volume of a cube, in cm^3, with side length 6 cm?

15.   Evaluate: $((x + 1^2) + 1)^2$ when $x=10$

16.   This year, Amanda averaged $18 per concert ticket. If she spent a total of $126 on concerts this year, how many concerts did she attend this year?

17.   How many pints are in 3 gallons?

18.   If Berde has 2 pairs of shoes, 3 pairs of pants, and 8 shirts, how many outfits can he make?

19.   What is the probability of getting a prime number when a die is rolled?

20.   Apples cost $.52 per pound and mangos cost $1.32 per pound. If Tealah buys 4.5 pounds of apples and 6.25 pounds of mangos, how much does she spend in dollars?

21.   A goat is tied to a post with a 32 foot leash in the middle of a field. How much area, in square feet, can the goat roam over?

22.   The point (3, -4) is in what quadrant?

23.   Find the sum of the first 75 odd positive numbers.

24.   What is 1/2 of 2/3 of 3/4?

25.   How many points are necessary to determine a plane?

26.   Drew is the tallest guy in his group of 5. Adam is shorter than Burford. Pat is not the shortest. Silas is taller than Pat but is not the third tallest. Burford is not one of the three tallest people. Who is the shortest in Drew's group?

27.   In Mrs. Hochstatter's living room there is a circular mirror with a diameter of 18 inches. What is the area of the mirror, in square inches?

28.   A perfect number is one that is equal to the sum of all its factors, except itself. Find a perfect number between 1 and 10.

29.   What is the length, in feet, of one side of a square with area 121 ft^2?

30.   How many factors does 36 have?

Challenge Questions

31. Evaluate: 21 + 29 + 37 + 45 + 53 + ... + 93

32. Grace has a class picture that measures 10 inches by $8\frac{1}{2}$ inches. The wood on the frame she uses is 1 1/8 inches wide. What is the perimeter, in inches, of the framed picture?

33. If Silas can eat 3 cookies in 10 seconds and Drew can eat 10 cookies in one minute, how long, in minutes, will it take them together to eat 420 cookies?

34. How many vertices does a dodecahedron have?

35. A ladder 13 feet long is leaning against a building. It touches the building at a point 12 feet above the ground. How far, in feet, is the base of the ladder from the building?

36. Evaluate: $2000(2000^{1000})^2$ Write as an exponent with a base of 2000.

37. Expand: $(x + 2)^2$

38. If you toss three coins at the same time, what is the probability of tossing 2 tails and 1 head?

39. If in a not-so-standard deck of cards there are 100 cards, 50 of which are blue and have an odd number on them, 40 of which are white and have an even number, and 10 of which have an odd number on them and are neither white nor blue. What is the probability of drawing, without replacement, a blue or even card and then drawing a card that is neither white nor blue?

40. Silas has a collection of foreign coins worth 8 cents and 5 cents. What is the largest price of something he could not pay for exactly, using 8-cent and 5-cent coins?

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Team Multiple Choice Contest

Math Team Bikers (MTB) went on a 50 mile bike race along the Centennial Trail. The following table shows the number of hours each team member competed, and whether they completed the course. Assume all MTBs traveled at constant speeds.

Member	Hours Taken	Completed
Gregg "X-Bike" Sampson	2	Yes
Krista "Rutser" Davis	2.5	Yes
Silas "Genius" Hillard	4	Yes
Josh "Birdman" Hoak	10	Yes
Carl "Reckless" Pierce	5	Yes
Colin "Spud " Sowder	5	50% of course
Lee "Tricycle" Pearson	25	Yes
Keisha "Wheelie" Carlson	8	Yes

Answer the following:

1. What was the total number of hours ridden by the "MTB" for this race?
    A) 61.5   B) 25   C) 50   D) 61   E) Answer not given
2. What was the total number of miles ridden by the "MTB" for this race?
    A) 400   B) 375   C) 425   D) 500   E) Answer not given
3. Who came in third place?
    A) Gregg   B) Krista   C) Silas   D) Colin   E) Answer not given
4. What is the difference in the average speed, in mph, between Colin and Josh?
    A) 0   B) 5   C) 6   D) 10   E) Answer not given
5. What is the mode of the average speed of all the members of the MTB bike team?
    A) 10   B) 11   C) 11.3   D) 10.7   E) Answer not given
6. How many miles from the finish line was Krista when Gregg finished the race?
    A) 10   B) 11   C) 11.3   D) 10.7   E) Answer not given
7. What is the ratio of Josh's average speed to Carl's average speed?
    A) 1:2   B) 2:1   C) 3:1   D) 2:5   E) Answer not given
8. How far apart was Sampson from Keisha 2 hours into the race?
    A) 35.5   B) 10.5   C) 22.5   D) 37.5   E) Answer not given
9. How many hours after Colin crashed at the halfway mark would Lee have passed him?
    A) 7   B) 8.5   C) 5.5   D) 7.5   E) Answer not given

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Team Contest

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1.   A "Math is Cool" cup can hold 10 oz of water. What is the least number of full "Math is Cool" cups that would cause a 1.5 gallon basin to overflow?

2.   Lisa earns a 5% commission for selling encyclopedias. How many dollars in sales does she currently have if she still needs $60 to buy a $100 radio?

3.   Bob is a teenager and he will be twice as old as his sister 3 years from now. How old will his sister be in three years, if she is 8 years younger than him now?

4.   For every 160 hours Mrs. Prior works, she receives 11.5 hours of vacation. She would like to accumulate at least 50 hours of vacation so she could travel to Mexico. Using the chart, determine how many more hours she needs to work. She receives each additional 11.5 hours only after working a <u>full</u> 160 hours.

Month	Hours Worked
January	161.5
February	120
March	138.5
April	110.5
May	170.5

5.   If Sampson's monitor is increased from 640 x 480 resolution to 1024 x 768, what is the ratio of the old amount of pixels to the new amount of pixels on his screen?

6.   If three boinks equals five boncs, and 2 boncs equal 1 bank, how many boinks are there in 20 banks?

7.   Four pieces of lead will last in a mechanical pencil for three hours. How long will fourteen pieces of lead last? Express answer in minutes.

8.   Jessica blows 12 green bubbles, 18 blue bubbles, and 42 red bubbles. If she randomly pops a bubble, what is the probability it is blue?

9.   Keisha has $416.15 in her checking account. She writes a check for $120, a check for $50, a check for $200, and a check for $49.50. How much money, in dollars, does she owe the bank if she must pay the difference plus a $5 fine for each whole dollar that she is overdrawn?

10.   Laine, Megan, and Courtney are studying for an English test by reading parts from *Romeo and Juliet* out loud. Laine reads Mercutio's lines, Megan reads Benvolio's lines, and Courtney reads Romeo's lines.   Of the 185 lines, Mercutio has 101 lines and Benvolio has 47 lines and Romeo has the rest. What percent of the lines does Courtney read?

Relay#1
Person#1
Evaluate: 5!

Relay#1
Person#2
Evaluate: TNYWG/4

Relay#1
Person#3
Evaluate: $\sqrt{TNYWG + 6}$

Relay#1
Person#4
Find the area of a circle with radius TNYWG.

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

Relay#2
Person#2
What is the greatest common factor of 36 and TNYWG?

Relay#2
Person#3
Find the sum of the first TNYWG÷9 positive whole numbers.

Relay#2
Person#4

Find the sum of the reduced numerator and denominator of $\dfrac{TNYWG}{30}$.

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Mental Math

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

	Person #1	
1	What is 1/2 divided by 1/8?	4
2	How many ways can the letters in the word "cat" be arranged?	6 (ways)
3	What is the difference between 15 and 7?	8
4	Evaluate: 100 - 99 + 98 - 97	2
	Person #2	
1	If Sampson works 6 hours a day, how many hours does he work in 10 days?	60 (hours)
2	If there are 10 blue marbles, 9 green marbles and 1 red marble, what is the probability of drawing a blue marble?	1/2
3	What is the probability of rolling a 2 or 3 on a regular 6-sided dice?	1/3
4	If Josh can read two 30 page books in an hour, how many pages can he read in a minute?	1 (page)
	Person #3	
1	Evaluate: 1/6 divided by 1/12	2
2	Evaluate 144 ÷ 2	72
3	What is one-third of 24?	8
4	If one clown can hold 10 balloons and 1 monkey can hold 15, how many balloons can be held by 2 monkeys and 1 clown?	40 (balloons)
	Person #4	
1	How many minutes elapse between 2:00 a.m. and 3:21 a.m.?	81 (minutes)
2	What is one-third of 75?	25
3	What is the result when you multiply 12 and 2, then add 6?	30
4	What is the area of a square with side length 5?	25

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College Knowledge Bowl Questions #1

1	When a certain number between 1 & 30 is divided by 5 the remainder is 0, when it's divided by 3 the remainder is 1, and when it is divided by 10 the remainder is 5. What is the number?	25
2	If there are goats and people in a field, and there are 20 heads and 50 feet, how many people are there?	15(people)
3	How many vowels are in the word "Mathematics"?	4
4	From a standard deck of cards, what is the probability of drawing a red card with a number greater than or equal to 5 and less than or equal to 9 on it?	5/26
5	If Mara can mow the lawn in 3 hours and Sarah can mow the lawn in 6 hours, how long would it take them if they mowed it together?	2 (hours)
6	Carl's hair grows 2 cm a week and he shaves it when it is 20 cm long. After 11 weeks how long will his hair be, in cm, if he started with a shaved head?	2 (cm)
7	How many diagonals are in a regular pentagon?	5(diagonals)
	Extra Question: Only use it if needed	
	$x^2 + x = 12$ what does x equal?	3 and -4

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College Knowledge Bowl Questions #2

1	What is the maximum number of times an octagon can intersect a circle?	16
2	What are the odds in favor of rolling a multiple of three on a six-sided dice?	1:2 or 1/2
3	If two angles are supplementary and one of the angles is 75 degrees, what is the measure of the other angle in degrees?	105 (degrees)
4	A rhombus has diagonals of 20 and x. If the area of the rhombus is 100, what is the value of x?	10
5	What is the probability of getting five heads in five consecutive coin tosses?	1/32
6	Quazic drives her Pinto to school at 72.5 mph. If it takes her 10 hours to get to school, how far away is school?	725 (miles)
7	Laine got a 100% on her exam. Fluffy, Cupcake, and Isabelle averaged 80% on their exams. What is Laine, Fluffy, Cupcake, and Isabelle's mean test score?	85 (%)
	Extra Question: Only use it if needed	
	What is the volume of a cube with surface area 96?	64

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College Knowledge Bowl Questions #3

1	For the following fractions, state the one that is largest: 4/5, 5/7, 7/10, 3/4 .	4/5
2	If each person shakes every other person's hand once in a group of 6 people, how many handshakes occur?	15
3	What is the probability of rolling a sum of 6 with two dice?	5/36
4	What is 9999 divided by 99?	101
5	What is the sum of two angles, in degrees, that are complementary?	90(deg)
6	What is the tens digit when you multiply 343 by 781?	8
7	If obsessive compulsive Zafrod opens a drawer every 3 minutes, how many times will he open it in 5 hours?	100 (times)
	Extra Question: Only use it if needed	
	What is 6! / 5! ?	6

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5th and 6th Grade - May 12, 2001

School Name_____Team #_____

Proctor Name_____Room #_____

Name:_____

1st Score

Out of 40

Individual Contest - Score Sheet
DO NOT WRITE IN SHADED REGIONS

	Answer	1 or 0	1 or 0		Answer	1 or 0	1 or 0
1	9569			21	1024π (square ft.)		
2	2,138,572			22	4 *or* 4th		
3	4/5			23	5625		
4	.4			24	1/4		
5	5616			25	3 (points)		
6	121			26	Adam		
7	2 *or* r 2			27	81π (in^2)		
8	40 (un^2)			28	6		
9	28			29	11 (ft)		
10	35(diagonals)			30	9 (factors)		
11	110			31	570		
12	24 (ways)			32	46 (inches)		
13	-3.6 (deg F)			33	15 (minutes)		
14	216 (cm^3)			34	20		
15	144			35	5 (feet)		
16	7 (concerts)			36	2000^{2001}		
17	24 (pints)			37	$x^2 + 4x + 4$		
18	48 (outfits)			38	3/8		
19	½			39	1/11		
20	($) 10.59			40	27 (cents)		

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School Name_____Team #_____

Proctor Name_____Room #_____

1st Score

Team Multiple Choice Contest-Score Sheet

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

"Math is Cool" Masters -- 2000-01

5th and 6th Grade - May 12, 2001

School Name_____Team #_____

Proctor Name_____Room #_____

Team Contest-Score Sheet

DO NOT WRITE IN SHADED REGIONS

1st Score

Out of 10

	Answer	1 or 0	1 or 0
1	20(cups)		
2	($) 800(.00)		
3	8(yrs old)		
4	99 (hours)		
5	25/64		
6	24 (boinks)		
7	630 (minutes)		
8	1/4		
9	($)18.35		
10	20(%)		

RELAYS

#1 36π   #2 4