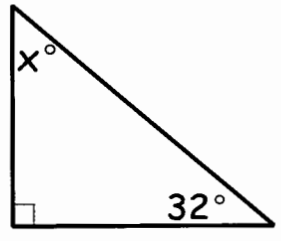
"Math is Cool" Championships-2001-02

6th Grade - March 1, 2002

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	Find the difference between 235 and 189.
2	Find the quotient between 273 and 3.
3	Evaluate: 4.57 + 31.2 - 12.2
4	What is the remainder when 6,472 is divided by 8?
5	Mara wants to change all of her money into Yen at the rate of 100 Yen = $2.00. How much Yen will she receive in exchange for $52.00?
6	What is the ten-thousands digit of 837,214,005?
7	Frank has 17 horse pastures, each containing 4 horses. How many horses does he have in his pastures?
8	What is the measure of angle x? 
9	Class starts at 10:30 a.m. It takes Aaron 20 minutes to walk from his house to class. What time should he leave his house if he wants to be to class 5 minutes before it starts.
10	Use <, >, or = to make the statement true. -3 □ -5
11	Write two hundred thousand in scientific notation.
12	A bag contains 1 red marble, 1 green marble, and 2,132 blue marbles. What is the probability of pulling 3 green marbles without replacement from the bag?
13	Sally bought 7 identical hair brushes for $7.21. How much, in dollars, would two hair brushes cost if the hair brushes are of equal value?
14	Evaluate: 4(3 - 2) + 5(7 - 2)

15	Charles Lindbergh was the first person to fly nonstop across the Atlantic. In 1927 he flew from New York to Paris, a distance of 3,610 miles, in 33.5 hours. To the nearest mph, what was his average speed?
16	Solve for x: $2x - 5 = 15$
17	Prime Number Eddy leaves his house only on days of the month that have a prime date. What is the maximum number of times he leaves his house in one month?
18	For every 10 questions Silas writes for math competitions, 6 questions can be used. If 30 questions are needed, how many questions will Silas have to write?
19	Max's attention span is 70 minutes. It takes 5 minutes for Max to write one question. How many questions will Max be able to write before his attention runs out?
20	Is 1 prime, composite or neither?
21	If Sarah can read 4 pages every 5 minutes, how many seconds will it take her to read 9 pages?
22	Simplify: $\sqrt{\frac{16+9}{81}}$
23	Torry bought 37 boxes of cookies at \$2.15 a box and sold them at \$2.75 a box. How much profit did Torry make, in dollars?
24	Daniel's trumpet case has a width of 20cm, a height of 30cm and a length 70 cm. If he has 123 cm of 10 cm-wide duct tape, how many more centimeters of 10cm wide duct tape will he need if he wants to cover his entire trumpet case exactly once.
25	Don was driving and noticed that the odometer read 110011 which is a palindrome. What will the odometer reading be the next time it is a palindrome?
26	Carl can chop 3/4 of a cord of wood in one hour. If his family needs 12 cords of wood to heat their house through the winter, how many hours must Carl chop wood?
27	What is the area of a right triangle with legs of length 16 and 4?
28	Evaluate: $5\ ^{1}/_{4} + 12\ ^{7}/_{8}$ (Write your answer as a reduced mixed number)
29	A 5 inch radius pizza cost \$4.00. How much, in dollars, does a 10 inch radius pizza cost if the cost per square inch is the same?
30	What is the slope of a line that passes though (3, -5) and (7, 31)?

Challenge Questions

31	What is the mean of the following set of numbers? {1,6,8,8,9,11,91} (write your answer as an improper fraction)
32	A certain bag of candy contains four different colors of candy: red, blue, green and orange. It is determined that there are 32 red candies and 49 green candies. Also, 30% of the pieces of candy are blue and 25% of the pieces of candy are orange. How many pieces of candy are in the bag?
33	Biff and Eho are both between the ages of 14 and 99 and their ages differ by 6. Both of their ages are prime and begin with the same digit. What is the youngest age the older of the two can be?
34	What is the first prime number greater than 20 that has a remainder of 4 when divided by 7?
35	Jamie, Holly and Liz are running around a track. Jamie runs 12 laps per 3 hours, Holly runs 6 laps per 4 hours and Liz runs 24 laps per 2 hours. If they all start together, how many hours will it take them to all return to the beginning at the same time?
36	Sally purchases pop in bulk for one-third the cost of buying individual cans from a pop machine. Sally drinks 5 pops per week. In eight weeks she saved $24. How much was she spending, in dollars, per week on pop before she started buying pop in bulk?
37	Joe wants to paint 160 acres of pavement. He builds a paint brush that is 8 feet 4 inches wide that he can pull with his car at 4 mph. How many hours will it take him to paint the 160 acres of pavement. Hint: 640 acres is 1 mile by 1 mile and a mile is 5280 feet.
38	Collinear points are points that all lie on the same straight line. Find x so that the following set of points are collinear. {(-2, -8), (1, 1), (7, x)}
39	A recipe calls for 1 tsp of baking powder plus, for every 3 servings, an additional teaspoon. Ryan used 6 tsp of baking powder. How many servings did he make?
40	A whole number is multiplied by itself. What is the sum of the numbers that cannot possibly be the units digit of the product?

"Math is Cool" Championships-2001-02

6th Grade - March 1, 2002

Team Multiple Choice Contest

The Mt. Rainier Math Team is hosting a track meet to earn money to go to the national math competition in Mississippi this summer. For purposes of calculations, assume participants finished their events.

Events	Number of participants	1st place finisher	2nd place finisher	3rd place finisher
100 meter dash	10	10 seconds	?	13 seconds
200 meter dash	15	24 seconds	25 seconds	26 seconds
400 meter dash	11	58 seconds	60 seconds	61 seconds
1600 meter run	7	5 minutes	6 minutes	7 minutes
3200 meter run	5	10 minutes 30 seconds	11 minutes	14 minutes
Triple Jump	4	32 feet 6 in	31 feet 4 in	29 feet 2 in

Questions

1	How many ways can 1st, 2nd and 3rd place be determined in the 3200 meter run assuming there were no ties? A) 60 B) 9 C) 5 D) 3 E) Answer not given
2	What is the difference in the first place finisher's time and the third place finisher's time in the 200 meter dash? A) 24 seconds B) 26 seconds C) 1 second D) 2 seconds E) Answer not given
3	The number of different participants in the 100 and 200 meter dash was 21. How many participants ran both races? A) 14 participants B) 13 participants C) 4 participants D) 10 participants E) Answer not given
4	The average length for all the triple jump participants was 30 feet. How far did the fourth participant jump? A) 27 feet B) 28 feet C) 29 feet D) 29 feet 1 inch E) Answer not given
5	What was the total number of meters run at the track meet by all participants in the 100, 200, 400, 1600, and 3200 meter events? A) 35,000 B) 35,600 C) 36,000 D) 37,000 E) Answer not given
6	The length of one lap of the track is 400 meters. How many times did the 1st place finisher pass the 3rd place finisher in the 3200 meter run? A) 5 B) 4 C) 3 D) 2 E) Answer not given
7	A track has 100 meter straight-a-ways and the ends are semicircles with a length of 100 meters. What is the area on the inside of the track? A) $10000\left(\frac{\pi+2}{\pi^2}\right)$ B) $10000\left(\frac{\pi+1}{\pi^2}\right)$ C) 30000/π D) 40000 E) Answer not given
8	What choice best describes the time of the second place finisher in the 100 meter dash if they were 7 meters behind the first place winner when they crossed the finish line? (Assume the runners ran at a constant speed) A) 10.1 seconds B) 10.25 seconds C) 10.75 seconds D) 11 seconds
9	What choice best describes how many meters from the finish line the third place finisher was in the 1600 meter run when the first place finisher crossed the finish line? (Assume they ran at the same speed the entire run.) A) 211 meters B) 301 meter C) 251 meters D) 686 meters

"Math is Cool" Championships-2001-02

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Team Contest

Express all answers as reduced fractions unless stated otherwise.
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Record all answers on the yellow cover sheet.

1	Farmers plant 20 seeds per square foot of soil. If a farmer wants to plant a square field that is 20 feet on a side, how many seeds are needed?
2	If Tom has $100 in the bank at a simple annual interest rate of 2%, how much, in dollars, will he have in the bank after one year?
3	The speed of a boat in still water is 20 mi/hr. It takes the same amount of time for the boat to travel 3 miles downstream (with the current) as it does for it to travel 2 miles upstream (against the current). Find the speed of the current in mi/hr.
4	If Libbey stays awake for the first 1/8 of science class and Christine stays awake for the last 1/3 of science class, how many minutes of the 48 minute science class are at least one of them awake?
5	Colin and Lee are playing basketball on a hot August day. Colin needs to drink 15 oz. of water per hour at 75°F to stay hydrated. For every degree that the temperature increases, he must drink an additional 1.5 oz. per hour. How many ounces of water will he need to drink per hour if the temperature is 97°F?
6	What is the 21st term in the sequence 1, 8, 15, 22, ...?
7	What is the difference of 18_9 and 10_3 in base 5?
8	Evaluate: (100 - 1)(100 - 2)(100 - 3) .... (100 - 1000)
9	Four cows can eat 4 bales of hay in 4 hours. Theoretically, how many cows are needed to eat 1 bale of hay in 30 minutes?
10	A family left for a store at 9:00 a.m. They reached the store at 10:30 a.m. the same day. If they drove at a constant speed of 40 mph, how many miles away was the store?

Practice Relay
Person#1
What is the product of 7 and 8?

Practice Relay
Person#1
What is the product of 7 and 8?

Practice Relay
Person#1
What is the product of 7 and 8?

Practice Relay
Person#1
What is the product of 7 and 8?

Practice Relay
Person#2
What is the sum of TNYWG and 21?

Practice Relay
Person#2
What is the sum of TNYWG and 21?

Practice Relay
Person#2
What is the sum of TNYWG and 21?

Practice Relay
Person#2
What is the sum of TNYWG and 21?

Practice Relay
Person#3
What is the quotient of TNYWG and 7?

Practice Relay
Person#3
What is the quotient of TNYWG and 7?

Practice Relay
Person#3
What is the quotient of TNYWG and 7?

Practice Relay
Person#3
What is the quotient of TNYWG and 7?

Practice Relay
Person#4
What is the difference between TNYWG and 19?

Practice Relay
Person#4
What is the difference between TNYWG and 19?

Practice Relay
Person#4
What is the difference between TNYWG and 19?

Practice Relay
Person#4
What is the difference between TNYWG and 19?

Practice Relay
Person#4
What is the difference between TNYWG and 19?

Relay #1
Person#1
T-shirts cost $11.00 a piece. Joe has $45. What is the largest number of t-shirts he can buy?

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Relay #1
Person#1
T-shirts cost $11.00 a piece. Joe has $45. What is the largest number of t-shirts he can buy?

Relay #1
Person#2
What is the area of a rectangle with side length TNYWG and 8?

Relay #1
Person#2
What is the area of a rectangle with side length TNYWG and 8?

Relay #1
Person#2
What is the area of a rectangle with side length TNYWG and 8?

Relay #1
Person#2
What is the area of a rectangle with side length TNYWG and 8?

Relay #1
Person#3
What is the sum of the digits of TNYWG and the largest prime factor of 30?

Relay #1
Person#3
What is the sum of the digits of TNYWG and the largest prime factor of 30?

Relay #1
Person#3
What is the sum of the digits of TNYWG and the largest prime factor of 30?

Relay #1
Person#3
What is the sum of the digits of TNYWG and the largest prime factor of 30?

Relay #1
Person#4
What is the product of $\sqrt{TNYWG+6}$ and 12?

Relay #1
Person#4
What is the product of $\sqrt{TNYWG+6}$ and 12?

Relay #1
Person#4
What is the product of $\sqrt{TNYWG+6}$ and 12?

Relay #1
Person#4
What is the product of $\sqrt{TNYWG+6}$ and 12?

Relay #2
Person#1
What is the perimeter of a square with side length 7?

Relay #2
Person#1
What is the perimeter of a square with side length 7?

Relay #2
Person#1
What is the perimeter of a square with side length 7?

Relay #2
Person#1
What is the perimeter of a square with side length 7?

Relay #2
Person#2
What is the measure of the third angle in a triangle if the measure of one angle is 89° and the other angle is (TNYWG)°

Relay #2
Person#2
What is the measure of the third angle in a triangle if the measure of one angle is 89° and the other angle is (TNYWG)°

Relay #2
Person#2
What is the measure of the third angle in a triangle if the measure of one angle is 89° and the other angle is (TNYWG)°

Relay #2
Person#2
What is the measure of the third angle in a triangle if the measure of one angle is 89° and the other angle is (TNYWG)°

Relay #2
Person#3
What is the sum of TNYWG and the prime factors of 20?

Relay #2
Person#3
What is the sum of TNYWG and the prime factors of 20?

Relay #2
Person#3
What is the sum of TNYWG and the prime factors of 20?

Relay #2
Person#3
What is the sum of TNYWG and the prime factors of 20?

Relay #2
Person#4
How many minutes would it take to fill a 140 gallon container that is being filled at a rate of TNYWG gallons per minute?

Relay #2
Person#4
How many minutes would it take to fill a 140 gallon container that is being filled at a rate of TNYWG gallons per minute?

Relay #2
Person#4
How many minutes would it take to fill a 140 gallon container that is being filled at a rate of TNYWG gallons per minute?

Relay #2
Person#4
How many minutes would it take to fill a 140 gallon container that is being filled at a rate of TNYWG gallons per minute?

"Math is Cool" Championships -- 2001-02

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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	46		
2	91		
3	23.57		
4	0		
5	2600[Yen]		
6	1		
7	68[horses]		
8	58[°]		
9	10:05a.m.		
10	>		
11	$2.0x10^5$ or $2x10^5$		
12	0		
13	[$]2.06		
14	29		
15	108[mph]		
16	10		
17	11[times]		
18	50 [questions]		
19	14[questions]		
20	neither		

	Answer	1 or 0	1 or 0
21	675[seconds]		
22	5/9		
23	[$]22.20		
24	697[cm]		
25	111111		
26	16 [hours]		
27	32[units^2]		
28	18 1/8		
29	[$]16.00		
30	9		
31	134/7		
32	180[pieces]		
33	29[yrs old]		
34	53		
35	2[hours]		
36	[$]4.50[per week]		
37	40 [hours]		
38	19		
39	15[servings]		
40	20		

"Math is Cool" Championships -- 2001-02

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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.

DO NOT WRITE IN SHADED REGIONS

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

"Math is Cool" Championships -- 2001-02

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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	8000[seeds]		
2	$102		
3	4 [mi/hr]		
4	22 [minutes]		
5	48 [oz]		
6	141		
7	$24_{[5]}$		
8	0		
9	8[Cows]		
10	60 [miles]		

"Math is Cool" Championships -- 2001-02

6th grade - March 1, 2002

School Name_____Team #_____

Proctor Name_____Room #_____

Key

Relay Contest - Score Sheet

Practice relay
56
77
11
8
Answer for relay #1
4
32
10
48
Answer for relay #2
28
70
70
2

"Math is Cool" Championships-2001-02

6th Grade - March 1, 2002
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 second smallest prime number?	3
2	What time is it 14 hours and 16 minutes after 4:15 a.m.	6:31 p.m.
3	What is the perimeter of a square with area 49 ?	28
4	What is one-fifth of the sum of 12 and 23?	7
Person #2		
1	How many quarters are in $4.25?	17 [quarters]
2	What is the greatest whole number smaller than 20 that divides evenly into 39?	13
3	What is 13 divided by 1/2?	26
4	Jason and Tom drew a triangle with sides 5 and 9. What is the largest possible integral length that the third side can be?	13
Person #3		
1	How many cups are in 1 gallon and 2 quarts?	24 [cups]
2	How many lines of symmetry does an equilateral triangle have?	3
3	What is the length of each side of a regular octagon with perimeter 24?	3
4	What is the sum of one-fourth and one-half?	3/4
Person #4		
1	Is the converse of the following true? (Answer Yes or No) If all of Mike's shoes are red, then none of his shoes are blue.	No
2	If Maureen received a 93% on her first geometry test and 87% on her second, what is the average of her first 2 scores?	90[%]
3	What is the difference between 120 and 85?	35
4	What is the product of 5 and the sum of 4 and 3?	35

"Math is Cool" Championships-2001-02

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College Knowledge Bowl Questions #1		
1	Leslie's hair grows 2 cm every month. She gets .2 cm trimmed off on the last Tuesday of every month. If she starts out with a shaved head on January 1st , how long will her hair be, in cm, on December 1st ?	19.8 [cm]
2	How many factors does 64 have?	7
3	What is the least common multiple of 21 and 35?	105
4	A broom 5 feet long leans against a building. It touches the building at a point 4 feet above the ground. How many feet is the base of the broom from the building?	3[feet]
5	Hank can eat 14 cheeseburgers in 1 hour, and Berde can eat 17 cheeseburgers in 1 hour. If they start at 1:00pm, and keep eating at a steady pace until 7:00pm, how many cheeseburgers will they eat?	186 [cheese burgers]
6	At the theater, each bag of popcorn holds 95 kernels. How many bags can be made with 665 kernels?	7[bags]
7	What is the probability of rolling a sum of 7 on 2 regular six-sided dice?	1/6
Number ***8*** is an extra question. Only use it if needed.		
8	Mr. Sampson needs to eat 4 Power Bars a day while hiking. Each Power Bar weighs 3 ounces. If the group will be hiking for 3 days, and Mr. Sampson wants to carry only 21 ounces of Power Bars, how many Power Bars will Sarah have to carry for him so he will be able to eat 4 Power Bars a day?	5(Power Bars)

"Math is Cool" Championships-2001-02

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College Knowledge Bowl Questions #2		
1	What is the first prime number greater than 103?	107
2	If Bob has 5 blue marbles, 8 orange, and 7 white marbles, what percentage of his marbles are blue?	25[%]
3	It takes 350 calories to raise the temperature of 10 pounds of body weight by 5 degrees. If Eric weighs 110 lbs and wants to raise his body temperature 10 degrees, how many calories will he need?	7700 [calories]
4	The sum of three different individual's ages is 48. What will be the sum of their ages in 5 years?	63[years]
5	Colin picks flowers for Christine for 2 hours, 30 minutes, and 10 seconds. How many seconds did he spend picking flowers?	9010 [seconds]
6	What is 3/4 of 4/5 of 5/6?	1/2
7	It takes Lee's sideburns 2 weeks to grow 1 mm. If he grows his sideburns for 2 years, how long, in mm, will his sideburns be?	52 [mm]
Number ***8*** is an extra question. Only use it if needed.		
8	Jamie's hair is 15 inches long. Whitney's is 9 inches long. How many inches must Whitney's hair grow to be as long as Jamie's?	6[inches]

"Math is Cool" Championships-2001-02

6th Grade - March 1, 2002

College Knowledge Bowl Questions #3		
1	What are the odds in favor of rolling a composite number with 1 roll of a fair 6-sided die?	0 $\frac{1}{2}$ $\frac{1}{3}$
2	A 33 liter pail is filled with water at a rate of one-third liter every three minutes. How many minutes will it take to fill one-third of the pail?	99 [mins]
3	What is the fraction equivalent, in reduced form, of .42?	21/50
4	How many cubes with side length 3 inches fit in a cube with side length 2 feet? (12 inches = 1 foot)	512[cubes]
5	What is the difference of the sum of first 3 positive even whole numbers and the sum of the first 3 odd positive whole numbers?	3
6	What is the reciprocal of the product of the reciprocals of 4 and 7?	28
7	If I count backwards by nines, starting at 987, what will be the last positive number I will say?	6
Number ***8*** is an extra question. Only use it if needed.		
8	Libbey needed 5 yards 2 feet and 7 inches of tie-dyed wall paper off of a roll to cover her bedroom walls. How many inches of wall paper does she need?	211 [inches]