

"Math is Cool" Championships - 1998-99

Sponsored by: EKA Chemicals

6th Grade - February 26, 1999

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.

1. What is the sum of the interior angles of a regular octagon?
2. Evaluate: $\frac{5}{7} + \frac{2}{21} - \frac{7}{6}$
3. What is the number in the thousandths place of the decimal expansion of $\frac{1234}{723}$?
4. If Silas won 90% of his chess matches during the first half of the season, what percent of his matches will he have to win in the second half of the season to have a 60% win rate for the year?
5. If the difference between two numbers is 2, and their sum is 62, what is the smaller of the two numbers?
6. Thirty math team students all shake hands with each other exactly once. How many handshakes occur?
7. What is the probability of rolling a sum of 8 with three six-sided dice?
8. What is the mean of the following data set?
12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22

9. What is the sum of the next three terms in the sequence?
64, 1, 32, 2, 16, 3, 8, 4, 4, 5, ...
10. What is the first prime number greater than 200?
11. What is 14% of 70? Express your answer as a decimal.
12. What is the length of the base of a right triangle that has an area of 24 and a height of 6?
13. Express .54 as a reduced fraction.
14. How many ways can President Nicole choose a committee of 3 students from a group of 7 students?
15. Stephen has 23 coins, all dimes and pennies, which add up to \$1.49. How many dimes does he have?
16. Evaluate: $2x^2 - 4x - 2$ for $x=3$.
17. The average of Katie's first 15 test scores is 94. What is the minimum score she must receive on her next test to maintain an average of 90%? (All tests are of equal value)
18. If Eli drives her car at 54 miles per hour, and travels 72 miles, how many minutes does it take her to reach her destination?
19. In triangle ABC, the measures of angle A and angle B are equal. If the measure of angle C is three times larger than the measure of angle A, what is the measure of angle C?
20. A Super Duper Pooper Scooper has a price tag of \$23.00, yet customers are charged \$25.07. What is the percent of the tax rate?
21. Jacob and Zeke had a donut eating contest. Jacob ate $8\frac{1}{2}$ dozen donuts and Zeke ate $7\frac{1}{4}$ dozen donuts. How many more donuts did Jacob eat than Zeke?

22. The sum of two prime numbers is 39. What is the smallest number that can be used in this sum?
23. What is the date 200 days from today? (Month/Day/Year)
24. The product of 25 positive integers is 42. What is the smallest possible sum of the 25 numbers?
25. What time is it 1732 minutes after 4:22 pm?
26. Five identical circus clowns are all exactly 62 inches tall. When one clown stands on the shoulders of another, their combined height is 114 inches. How tall would the five clowns be, in inches, if they all stood on each other's shoulders?
27. If Jackie Chan is attacked by 120 bad guys, and needs to kick the first bad guy once, the second one twice and so on, how many kicks would be needed to accomplish justice?
28. A certain dog's stupid trick involves barking the nearest prime number that is yelled out. If Mr. Sampson yells out "25", how many times will the dog bark?
29. If the Vikings crush the Broncos with a score of 56-6, what is the least common multiple of the two scores?
30. If Joel has three dances in his performance, each with twice the steps of the dance before it, how many steps will he dance if final dance has 48 steps?

"Math is Cool" Championships-1998-9

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Team Multiple Choice Contest

-
1. Ryan and Drew each flip a coin once. What is the probability that at least one of their flips is a tail?
A) $1/2$ B) 0 C) $3/4$ D) $2/3$ E) $1/4$ F) 1
-
2. Sixty-four sugar cubes are arranged into a 4 by 4 by 4 cube. The cube is spray painted on all of its faces. The 64 cubes are then placed in a bag. What is the probability that a cube drawn has exactly two painted faces?
A) $1/64$ B) $1/4$ C) $1/16$ D) $1/8$ E) Answer not given
-
3. Katie has three times more pennies than Lily. Lily has 17 more pennies than Amy. Amy has half as many as Beth. If Beth has 16 pennies, how many pennies does Katie have?
A) 75 B) 25 C) 48 D) 51 E) 50 F) 45
-
4. At Sampson's General Store, pens cost 50¢ and pencils cost 20¢, but you cannot buy more than twice as many pencils than pens. How many pencils can you buy with \$36.00?
A) 60 B) 64 C) 48 D) 40 E) 80 F) 72
-
5. If the three members of Hanson and the five members of the Spice Girls each shake hands with each member of the other group exactly once, how many handshakes occur?
A) 5 B) 10 C) 15 D) 28 E) 100 F) Answer not given
-
6. 1999 is a
A) prime number B) composite number C) irrational number D) Answer not given

7. In how many ways can you arrange the letters in the word "OREGON"
A) 6 B) 24 C) 60 D) 120 E) 200 F) Answer not given

8. If Stephen was born in January 1982, to the nearest month, how many months old is he?
A) 13 B) 175 C) 180 D) 190 E) 205 F) Answer not given

9. Mike, Steve, Eric, and Jon go to a sandwich shop. They can each choose from among 3 different meats, 4 different breads, and 3 different beverages. How many meal combinations are possible for one person?
A) 12 B) 24 C) 48 D) 56 E) 72 F) Answer not given

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Team Contest

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1. What is the sum of $1624-729$, $231-16$, and $870+19$?
2. What is the reciprocal of the sum of $5/6$ and $2/3$?
3. A card is taken from a standard deck of 52 cards. What is the probability that it is not a heart, ace, or king?
4. Two dice are rolled. What is the probability that their sum is prime?
5. Farmer Sampson has a square piece of land that he has parceled into 16 congruent, square lots with area 100 feet squared. If he wants to re-divide his property into 25 congruent square lots, what will be the area of each new lot?
6. An even number is divided by four. You know the remainder is not 2, so what must it be?
7. Write .375 as a fraction in lowest terms.
8. Find the greatest common divisor of 120 and 1024.
9. The product of all prime numbers between 1 and 1999 is divided by 10. What is the remainder?
10. Find the missing number. $\frac{1}{3} = \sqrt{\frac{?}{27}}$

Practice Relay

Person#1

Find the sum of 12, 6, 5 and 1.

Practice Relay

Person#2

Find the quotient of TNYWG and 3.

Practice Relay

Person#3

Find the product of TNYWG and $\frac{3}{2}$.

Practice Relay

Person#4

What is the average side length of a triangle with perimeter TNYWG?

Relay #1

Person#1

What is the denominator of the simplified fraction of the probability of drawing a red card from a standard deck of cards knowing that the ace of clubs and king of diamonds are missing?

Relay #1

Person#2

Evaluate: $1 + 2 + 3 + 4 + 5 + 6 + 17 + 13736 + \frac{\text{TNYWG}}{2}$

Relay #1

Person#3

Evaluate: $\text{TNYWG} - 13 - 18 - 23 - 34 - 100$

Relay #1

Person#4

Find the sum of the TNYWG and the sum of the interior angles of a triangle.

Relay#2

Person#1

Evaluate: $27 + 15 + 9 + 3$.

Relay#2

Person#2

Find the GCD of TNYWG and the area of a square with side length 3.

Relay#2

Person#3

Find the sum of the first TNYWG numbers starting with 1.

Relay#2

Person#4

TNYWG and add three. Then divide the result by 2. Then multiply that result by 0. Finally add 10.

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Mental Math

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Person #1

1. Evaluate two to the fourth power.
2. What is the sum of one-half, one-fourth and one-sixteenth?
3. What is the area of a triangle with base length of 12 and height of 7?
4. What is one-fifth of the sum of 11 and 19?

Person #2

1. What is the radius of a circle with circumference 60π ?
2. What is the product of the sum of 4 and 7 and the difference of 15 and 4?
3. What is the perimeter of a regular hexagon with side length 7?
4. Evaluate 3 to the third power

Person#3

1. What is the area of a circle with radius 10?
2. If the value of 17 coins consisting of dimes and nickels is 85¢, how many dimes are there?
3. If a pond algae doubles in size every day and completely covers the pond on day 10, on which day will the pond be half covered?
4. What is 70 divided by one-half?

Person#4

1. What is five times four times three times two times one?
2. If there are eight cows and seven chickens in a field, how many legs are there?
3. What is the least common multiple of 8 and 11?
4. Two angles are complementary. What is their sum?

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College Knowledge Bowl Questions #1

1. What is the tens digit of the product of 2,388 and 5,001?

Answer: 8

2. What is the remainder when 43281 is divided by 3?

Answer: 0

3. How many ways can you arrange 4 different books on a shelf?

Answer: 24

4. A 12 liter pail is filled with water at a rate of one half liter per minute. How many minutes will it take to fill two-thirds of the pail?

Answer: 16

5. If Silas had 12 virtual girlfriends, how many different ways could he choose three to go with him to see his favorite movie, "Beyond Infinity"

Answer: 220

6. In how many ways can the letters in the word "CONTEST", spelled with all capital letters, be arranged?

Answer: 2520

7. What is the sum of the numerator and the denominator after you reduce the fraction 16 over 144

Answer: 10

Extra Question: What is measure of the third angle of a triangle knowing that the first angle has a measure of 59.5 degrees and the second angle has a measure of 42.3 degrees?

Answer: 78.2

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College Knowledge Bowl Questions #2

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1. Roy pushes Nicole up a 223 foot hill. Roy pushes Nicole up the hill 15 feet each day and Nicole slides down the hill 7 feet each night. How many days will it take Roy to get Nicole to the top of the hill?

Answer: 27

-
2. How many diagonals can be drawn in a convex pentagon?

Answer: 5

-
3. If Joel counts backwards by 7, starting at 9,005, what will be the last positive number Joel will say?

Answer: 3

-
4. Silas and Eric counted leaves on two plants. Eric's count was a one digit number. Silas got a three digit number. If the difference between their numbers was 91, what was the sum of their numbers?

Answer: 109

-
5. If the product of an even number and an odd number is 878, what is the largest possible value of the odd number?

Answer: 439

-
6. When a certain number is divided by 4, the remainder is 3 and the quotient is 15. What is the number?

Answer: 63

-
7. If 39 is the sum of three consecutive positive numbers, what is the smallest of the three numbers?

Answer: 12

Extra Question: How many ways can three people be seated in 8 chairs?

Answer: 336

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College Knowledge Bowl Questions #3

1. Two positive numbers differ by 7. One number has 3 digits and the other number has 4 digits. What is the largest possible sum for these two numbers?

Answer: 2005

2. Nicole owns one white, two black, and three brown pigs. If all the pigs could talk, how many could truthfully say "I am the same color as one or more of the other pigs."

Answer: 5

3. What positive number when added to itself produces the same answer as when it is multiplied by itself?

Answer: 2

4. What is 3 to the seventh power?

Answer: 2187

5. If all the angles of a triangle are different and have integer values, what is the largest possible angle this triangle could have?

Answer: 177(degrees)

6. Ryan has four times as many books as Joel and a third as many books as Silas. Joel has 30 books. How many books does Silas have?

Answer: 360

7. What is the sum of the factors of 12?

Answer: 28

Extra Question: What positive number when multiplied by itself always returns itself as the answer?

Answer: 1

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School Name _____ Team # _____

Proctor Name _____ Room # _____

Key

Full Name: _____

1st Score

Individual Contest - Score Sheet

Out of 30

DO NOT WRITE IN SHADED REGIONS

	Answer		
1.	1080		
2.	-5/14		
3.	6		
4.	30(%)		
5.	30		
6.	435		
7.	7/72		
8.	17		
9.	9		
10.	211		
11.	9.8		
12.	8		
13.	27/50		
14.	35		
15.	14		

	Answer		
16.	4		
17.	30(%)		
18.	80(Min)		
19.	108(degrees)		
20.	9(%)		
21.	15(donuts)		
22.	2		
23.	Sept/14/1999 or 9/14/99		
24.	34		
25.	9:14 p.m.		
26.	270(inches)		
27.	7260(kicks)		
28.	23		
29.	168		
30.	84(steps)		

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School Name _____ Team # _____

Proctor Name _____ Room # _____

Key

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

"Math is Cool" Championships -- 1998-9

6th Grade - February 26, 1999

School Name _____ Team # _____

Proctor Name _____ Room # _____



Team Contest-Score Sheet

1 st Score

Out of 10

DO NOT WRITE IN SHADED REGIONS

Answer			
1.	1999		
2.	$\frac{2}{3}$		
3.	$\frac{33}{52}$		
4.	$\frac{5}{12}$		
5.	64		
6.	0		
7.	$\frac{3}{8}$		
8.	8		
9.	0		
10.	3		

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Key

Mental Math - Score Sheet

-
- A. 1. 16
2. 13/16
3. 42
4. 6

-
- B. 1. 30
2. 121
3. 42
4. 27

-
- C. 1. 100π
2. 0
3. 9 or 9th day
4. 140

-
- D. 1. 120
2. 46(legs)
3. 88
4. 90 or 90°

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Proctor Name _____ Room # _____



Relay Contest - Score Sheet

Practice relay

4

Answer for relay #1

13,767

Answer for relay #2

10